Medical Wilder
Medical Lib.
JAN 1 1 1927

THE BOSTON

Medical and Surgical JOURNAL

Owned and Published by the MASSACHUSETTS MEDICAL SOCIETY

OFFICIAL ORGAN OF THE NEW ENGLAND SURGICAL SOCIETY, THE BOSTON SURGICAL SOCIETY, INC., THE NEW ENGLAND PEDIATRIC SOCIETY, AND THE NEW HAMPSHIRE SURGICAL CLUB

Volume 196, Number 1
$6 per Annum, 25c per Copy

JANUARY 6, 1927

Published Weekly in Boston
at 126 Massachusetts Avenue

CONTENTS

MASSACHUSETTS MEDICAL SOCIETY

Thoracoplasty in Pulmonary Tuberculosis. *Wyman Whittemore* 1

ORIGINAL ARTICLES

Lumbo-Sacral Backache. *Charles E. Ayers* 9
A Simplified Classification of Chronic Arthritis. *Charles F. Painter* 16
Experimental Studies in Ovarian Function.
II. The Relation of Blood Supply to Ovarian Function in the Rat. *Donald Macomber.* 19
III. The Relation of Nerve Supply to Ovarian Function in the Rat. *Donald Macomber.* 21

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Case 13011—Streptococcus Septicemia. *Richard C. Cabot.* Case 13012—Shall We Amputate? *Charles J. White.* Case 13013—To Operate or to "Ochsnerize"? *Edward L. Young, Jr.* 24

EDITORIALS

Interference by the Prohibition Administrator with the Right of Physicians to Purchase Alcohol 32
The Hazards of the Home 32
The Training of Nurses 33
Gas Bacillus Infection from Woolen Clothing 33
This Week's Issue 34

(*Contents continued on next page*)

THE NEXT ANNUAL MEETING OF THE MASSACHUSETTS MEDICAL SOCIETY WILL BE HELD IN BOSTON, AT THE HOTEL STATLER, JUNE 6, 7 AND 8, 1927

For list of Officers of the Society and of the District Medical Societies, see advertising page ii.

Just Ready—Third Edition

Sollmann's Pharmacology

The book has been reset from cover to cover. It had to be! First, there was the new revision of the United States Pharmacopeia. This necessitated a thorough review of the preparations, making them conform with the new standard and changing the nomenclature and spelling accordingly.

Then, the accelerated pace of pharmacologic investigation has brought into therapeutics many essentially new drugs, such as insulin, ethylene, parathyroid hormone. In many subjects, such as the autonomic system, chemotherapy, lead poisoning, etc., new conceptions have come forward. All these changes necessitated a virtual rewriting of the entire book.

As the work is planned to be of use in clinical medicine, that information which has a direct bearing upon the **practice** of medicine has been put in the larger-size type, while data of less frequent use has been relegated to a smaller-size type. This arrangement has been facilitated by the generous use of paragraph headings.

The bibliography remains as heretofore a distinct feature of this book. It has been revised and some 1200 new titles added. In the Appendix will be found a check list for the study of important preparations and a tabulation of average doses.

Octavo volume of 1184 pages, illustrated. By TORALD SOLLMANN, M.D., Professor of Pharmacology and Materia Medica in the School of Medicine, Western Reserve University. Cloth, $7.50 net.

W. B. SAUNDERS COMPANY **Philadelphia and London**

Entered at the Postoffice at Boston as Second Class Matter

CONTENTS

(Continued)

BOOK REVIEWS

Chemotherapy with Special Reference to Treatment of Syphilis. J. A. Kolmer..... 40
Imhotep, The Vizier and Physician of King Zoser and Afterwards the Egyptian God of Medicine. Jamieson B. Hurry..... 39
The Meaning of Disease: An Inquiry in the Field of Medical Philosophy. William A. White..... 42
Pneumoconiosis. Henry K. Pancoast and Eugene P. Pendergrass 40
Sketch of the History of the Mayo Clinic and the Mayo Foundation..... 41
Surgical Clinics of North America 1926..... 42
A Textbook of Embryology. Harvey E. Jordan.... 39
The X-Ray in Embryology and Obstetrics. W. A. N. Dorland and M. J. Hubeny..... 41

CORRESPONDENCE

An Appeal for Help. Samuel B. Woodward..... 35
Expert Testimony in Mental Cases. D. J. Fennelly. 35

MISCELLANY

Cases Reported to the Massachusetts Department of Public Health for the Weeks Ending December 18 and 25, 1926..... 36
Citation for the Award of the Sofie A. Nordoff-Jung Cancer Prize..... 35
Connecticut Department of Health — Morbidity Report for the Week Ending December 24, 1926... 36
Death Rates of Mothers from Childbirth: 1925..... 31
Good Milk..... 34
Keeping the Atmosphere Clean..... 34
Pay for Christmas Seals Promptly..... 23
Prnicipal Causes of Death: 1925..... 31
Trichinosis a Needless Disease..... 23

NOTICES 36

RECENT DEATHS..... 35

REPORTS AND NOTICES OF MEETINGS..... 37

SOCIETY MEETINGS..... 39

The Massachusetts Medical Society

OFFICERS ELECTED BY THE COUNCIL, JUNE 8, 1926, FOR 1926-1927

PRESIDENT: JAMES S. STONE, 286 Marlborough St., Boston.
VICE-PRESIDENT: JOHN M. BIRNIE, 14 Chestnut St., Springfield.
SECRETARY: WALTER L. BURRAGE, 182 Walnut St., Brookline.
TREASURER: ARTHUR K. STONE, Auburn St., Framingham Center.

STANDING COMMITTEES FOR 1926-1927

OF ARRANGEMENTS
L. S. McKittrick, W. T. S. Thorndike, James Hitchcock, E. P. Hayden, H. Q. Gallupe, T. H. Lanman.

ON PUBLICATIONS AND SCIENTIFIC PAPERS
E. W. Taylor, R. B. Osgood, F. T. Lord, R. M. Green, A. C. Getchell.

ON MEMBERSHIP AND FINANCE
D. N. Blakely, Algernon Coolidge, Samuel Crowell, Gilman Osgood, Homer Gage

ON ETHICS AND DISCIPLINE
David Cheever, W. D. Ruston, S. F. McKeen, W. C. Keith, Kendall Emerson.

ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS
C. F. Painter, J. F. Burnham, A. G. Howard, R. L. DeNormandie H. P. Stevens.

ON STATE AND NATIONAL LEGISLATION
J. S. Stone, E. H. Stevens, F. E. Jones, T. J. O'Brien, J. B Birnie.

ON PUBLIC HEALTH
Victor Safford, E. F. Cody, R. I. Lee, T. F. Kenney, Francis G Curtis.

ON PUBLIC INSTRUCTION
A. P. Merrill, W. P. Bowers, F. W. Snow, W. H. Robey, R. L. Le Conrad Wesselhoeft, F. S. Hopkins.

OFFICERS OF THE SECTIONS FOR 1927

SECTION OF MEDICINE
Chairman, Ayres P. Merrill, Pittsfield; *Secretary,* Hervey L. Smith, Springfield.

SECTION OF SURGERY
Chairman, Charles G. Mixter, Boston; *Secretary,* Richard H. Miller, Boston.

SECTION OF TUBERCULOSIS
Chairman, Adam S. MacKnight, Attleborough; *Secretary,* Randall Clifford, Boston.

SECTION OF PEDIATRICS
Chairman, Arthur R. Crandell, Taunton; *Secretary,* J. Herbe Young, Newton.

SECTION OF OBSTETRICS AND GYNECOLOGY
Chairman, Richard S. Benner, Springfield; *Secretary,* Arthur F. G Edgelow, Springfield.

SECTION OF RADIOLOGY AND PHYSIOTHERAPY
Chairman, Frank B. Granger, Boston; *Secretary,* Frederick W O'Brien, Boston.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES

ELECTED BY THE DISTRICT MEDICAL SOCIETIES BETWEEN APRIL 15 AND MAY 15, 1926

BARNSTABLE—*President,* F. O. Cass, Provincetown; *Vice-President,* S. M. Beale, Jr., Sandwich; *Secretary,* J. L. Chute, Osterville; *Treasurer,* H. B. Hart, Yarmouthport; *Librarian,* E. E. Hawes, Hyannis.

BERKSHIRE—*President,* G. F. MacKay, Dalton; *Vice-President,* T. P. Hennelly, Pittsfield; *Secretary,* A. P. Merrill, Pittsfield; *Treasurer,* C. T. Leslie, Pittsfield.

BRISTOL NORTH — *President,* A. S. MacKnight, Attleboro; *Vice-President,* F. H. Dunbar, Mansfield; *Secretary,* J. L. Murphy, Taunton; *Treasurer,* J. V. Chatigny, Taunton.

BRISTOL SOUTH—*President,* S. E. Donovan, New Bedford; *Vice-President,* P. E. Truesdale, Fall River; *Secretary,* G. E. Borden, Fall River; *Treasurer,* G. E. Borden, Fall River.

ESSEX NORTH—*President,* R. V. Baketel, Methuen; *Vice-President,* A. M. Hubbell, Haverhill; *Secretary,* J. Forrest Burnham, Lawrence; *Treasurer,* E. H. Ganley, Methuen.

ESSEX SOUTH—*President,* C. H. Phillips, Beverly; *Vice-President,* R. E. Bicknell, Swampscott; *Secretary,* R. E. Stone, Beverly; *Treasurer,* Andrew Nichols, 3rd, Danvers; *Librarian,* C. M. Cobb, Lynn.

FRANKLIN—*President,* P. F. Leary, Turner's Falls; *Vice-President,* A. H. Ellis, Greenfield; *Secretary,* Charles Moline, Sunderland; *Treasurer,* Charles Moline, Sunderland.

HAMPDEN—*President,* G. H. Janes, Westfield; *Vice-President,* E. A. Bates, Springfield; *Secretary,* H. L. Smith, Springfield; *Treasurer,* H. L. Smith, Springfield; *Librarian,* H. L. Smith, Springfield.

HAMPSHIRE—*President,* W. B. Segur, Enfield; *Vice-President,* C. T. Cobb, Northampton; *Secretary,* L. O. Whitman, Northampton; *Treasurer,* L. O. Whitman, Northampton; *Librarian,* F. H. Smith, Hadley.

MIDDLESEX EAST—*President,* R. R. Stratton, Melrose; *Vice-President,* T. E. Caulfield, Woburn; *Secretary,* A. R. Cunningham, Winchester, *Treasurer,* Richard Dutton, Wakefield; *Librarian,* G. W. Nickerson, Stoneham.

MIDDLESEX NORTH—*President,* M. L. Ailing, Lowell; *Vice-President,* Joseph Lamoureaux, Lowell; *Secretary,* T. A. Stamas, Lowell; *Treasurer,* E. J. Clark, Lowell; *Librarian,* P. J. Mehan, Lowell.

MIDDLESEX SOUTH—*President,* G. L. West, Newton Centre; *Vice-President,* A. W. Dudley, Cambridge; *Secretary,* S. M. Biddle, Cambridge; *Treasurer,* Edward Mellus, Newton.

NORFOLK—*President,* C. W. MacDonald, Roxbury; *Vice-President,* M. H. A. Evans, Dorchester; *Secretary,* F. S. Cruickshank, Brookline *Treasurer,* G. W. Kaan, Boston.

NORFOLK SOUTH—*President,* W. G. Curtis, Wollaston; *Vice-President,* D. A. Bruce, Atlantic; *Secretary,* N. R. Pillsbury, South Braintree; *Treasurer,* N. R. Pillsbury, South Braintree; *Librarian,* N. R Pillsbury, South Braintree.

PLYMOUTH—*President,* A. C. Smith, Brockton; *Vice-President,* J. I Shaw, Brockton; *Secretary,* L. B. Packard, Brockton; *Treasurer,* L. B Packard, Brockton; *Librarian,* J. H. Weller, State Farm.

SUFFOLK—*President,* E. F. Joslin, Boston; *Vice-President,* R. I DeNormandie, Boston; *Secretary,* A. H. Crosbie, Boston; *Treasurer,* John Rock, Boston.

WORCESTER—*President,* E. H. Trowbridge, Worcester; *Vice-President,* F. H. Washburn, Holden; *Secretary,* C. A. Sparrow, Worcester *Treasurer,* G. O. Ward, Worcester; *Librarian,* A. C. Getchell, Worcester

WORCESTER NORTH—*President,* W. E. Currier, Leominster; *Vice-President,* A. F. Lowell, Gardner; *Secretary,* C. H. Jennings, Fitchburg; *Treasurer,* F. H. Thompson, Jr., Fitchburg.

Fellow-Members! By patronizing our advertisers, you will be supporting your own Association Journal.

THE BOSTON
Medical and Surgical
JOURNAL

VOLUME 196 JANUARY 6, 1927 NUMBER 1

The Massachusetts Medical Society

Section of Tuberculosis*

THORACOPLASTY IN PULMONARY TUBERCULOSIS*

BY WYMAN WHITTEMORE, M.D., F.A.C.S.

DURING the last 19 years surgery has been brought to the aid of a certain group of pulmonary tuberculosis cases. These are patients in whom the disease is largely limited to one side of the lungs and whom sanatorium treatment, including artificial pneumothorax, has failed to benefit. On December 11, 1907, Freidrich[1], at that time the chief of the surgical clinic at Marlburg, Germany, performed the first extra-pleural thoracoplasty operation. Brauer was the internist at this same clinic. He was very instrumental in bringing this to pass as he was the one who had been urging Freidrich to do this operation and it was his patient who was the first to be so operated upon. Five years later, 1912, Archibald of Montreal performed the first thoracoplasty on this continent upon a tubercular patient. For about 15 or 16 years the Germans, Swiss, and Scandinavians have recognized the beneficial results of this procedure, whereas it is only in the last few years that the rest of the world has become familiar with this work and now realizes the remarkable results often brought about upon tubercular patients who, previous to the discovery of this operation, were faced with an early death.

In dealing with this type of thoracic surgery it has seemed to me that greater coöperation between the medical man and the surgeon was required than in almost any other form of chest surgery. In spite of this, in the last analysis, to the man who does the operation falls most of the responsibility, especially if the case ends fatally. The surgeon should then be in a position to have definite knowledge as to what cases should or should not be operated upon or at least what ones he is willing to undertake. It is my belief[2] that operation is indicated in those cases of advanced unilateral tuberculosis in which sanatorium treatment and artificial pneumothorax have failed. Immediately the question comes up: Is there ever a case with advanced tuberculosis of one lung and none in the other? I think such a condition is possible but must be very rare. If such is a true statement is it justifiable to operate on the diseased side when there is a process in the so-called "good lung"? As my own experience increases and also my knowledge through the communications of other surgeons interested in this line of work, I have come to the conclusion that it is a correct procedure to operate upon these patients provided the process in the good lung is of a very limited extent and confined especially to the apex. An active process situated in the lower lobe or about the hilum contraindicates operation. I frankly say that it is difficult for me to determine how active a process is in the good lung. Take a recent case for example. A young man came to me for operation with a very extensive process in his left lung, with cavity formation, but nothing abnormal to be heard in the right lung. X-ray, however, showed considerable shadow in the right lung and X-ray diagnosis was an active process in the right lung. Knowing well the reputation of the pulmonary specialist who sent the patient to me, and being told by him that in his opinion the right lung was not active I did the operation in two stages with a very happy result. I mention this case to show how important and valuable to the surgeon it is to have the close coöperation of the pulmonary specialist.

It may be impossible to produce an artificial pneumothorax on account of the lung being firmly adherent to the costal pleura, or the pneumothorax created may be only a partial one. In both these conditions I believe a complete posterior thoracoplasty should be done. I am not in favor of a partial thoracoplasty and a partial pneumothorax. My main reasons for this are that with the formation of adhesions there is a gradual loss of the pneumothorax and as the lung expands there is danger of more infection, and if there is a breaking into the pleural

*Read at the annual meeting of the Massachusetts Medical Society, June 8, 1926.

cavity of a small abscess situated in the periphery of the lung an acute pyopneumothorax forms which may prove fatal. It seems probable that the pressure from the thoracoplasty on the pneumothorax may aid in bringing this about.

Unfortunately there has been a feeling that operation should be undertaken only as a last resort, and patients with large cavities and having had repeated severe hemorrhages are not as good surgical risks as they would have been many months earlier in the disease. Patients 50 years of age and over are poor risks. Operation is especially indicated in lesions of the lower lobe, also in recurrent severe hemoptyses when an artificial pneumothorax cannot be produced. The condition of the heart must be investigated in order to determine whether or not it will stand operation. Tuberculosis of the larynx does not seem to be any contraindication for operation, whereas tuberculosis of the kidneys is a contraindication. Whether or not a patient having tuberculosis of the intestines should be submitted to a thoracoplasty seems to be a mooted question as European surgeons believe these individuals should not be operated upon, whereas American surgeons are rather inclined to believe that they should be.

Of course one's judgment in sizing up a patient in order to determine whether or not he has enough resistance to stand operation is the main guide to selecting cases for surgery. Patients with fibrotic formation and cavitation, with contraction of the lung due to scar tissue formation, are proper ones for operations; also those cases with extensive consolidation in which the sputum is small in amount and the pleura thick. There is another type that seems favorable for operation and that is those cases in which the disease shows a rapid progress with a large amount of sputum.

Another group includes cases in which not only the lung but the pleura is involved. In the closed tuberculous empyemas in which aspiration shows the fluid to be sterile, extra-pleural thoracoplasty should be performed after the pleural cavity has been emptied. If it is necessary to do the operation in two or more stages it will probably be necessary to aspirate one or more times between operations. And it may, even, be necessary to aspirate after the completion of the whole surgical procedure. In the open empyemas in which there is a persistent thoracic fistula following operation for tubercular empyema, extra-pleural thoracoplasty offers the best means of cure.

Certain cases in which the mediastinum and its contents are displaced towards the diseased side may be greatly benefited by this operation. In these cases nature has been trying to cure the disease by the diaphragm rising and the ribs slanting downwards—this being brought about by the compensatory emphysema of the good lung, decrease in size of the diseased lung, and the contraction of scar tissue in it.

Still another group in which thoracoplasty may be indicated are those cases in which following the long use of artificial pneumothorax the lung has become atelectatic and shows no sign of expanding. When an individual in whom the lung has been kept collapsed for a long time with artificial pneumothorax finds that each time the lung is allowed to expand there is an increase in symptoms, this operation should be strongly considered.

There are certain so called border-line cases in which X-ray demonstrates a band or several bands of adhesions which prevent complete collapse of the lung with artificial pneumothorax. It is true that in some of these conditions the adhesions gradually disappear under treatment, yet in many others—probably the vast majority—they do not, and with the diseased lung in close proximity to the band of adhesions, in stretching this the lung may be opened, with a resulting empyema or tension pneumothorax. So here again thoracoplasty should be performed.

The surgical treatment of pulmonary tuberculosis is based on operations that tend to collapse or compress either partially or completely the diseased lung. Freidrich, the first surgeon to perform the operation of thoracoplasty upon a pulmonary tubercular case (already referred to as occurring in 1907), made a long, curved incision starting high in the back close to the vertebral column, going down to about the 10th rib in the axillary line and then up in front to the corresponding level of the posterior incision. This was made in order to remove the whole of the upper 10 ribs. The operation being a very formidable one, Wilms of Heidelberg devised an operation that consisted of removing a section, both anteriorly and posteriorly, of the upper 10 ribs but leaving the middle section of each rib. In 1910 Sauerbruch, who formerly had been Freidrich's first assistant, being appointed professor of surgery at the University of Zurich in Switzerland, performed the operation that bears his name and is the accepted one in use today in this country. In this, posterior sections, only, of the upper 10 or 11 ribs are removed. Brauer, at about the same time, 1910, although an internist, decided to operate on these cases himself. He believed that that part of the ribs which lie beneath the scapula should be removed. Strangely, enough, the results of all four of these pioneers in this field of surgery have been very similar. Wilms and Freidrich's series are small, both being now dead, Brauer's somewhat larger, but Sauerbruch's cases number well over 500. All four found that between 50% and 60% of the cases that survived operation were cured or improved.

Before taking up the operation itself, I wish to speak of the anesthetic. Some years ago local anesthesia, either paravertebral or local infiltration, was considered the ideal one. At the present time surgeons are tending more and more towards a general anesthetic or a combination of both general and local. Sauerbruch is using ether, Archibald gas and oxygen or this with local. Up to the last year I have used local entirely, but recently have used gas and oxygen for the second stage of the operation. The main objection to a general anesthetic is that the patient may aspirate the contents of an abscess cavity into some other part of the lung. But it seems to me that this may be provided for by performing the operation after the patient has emptied the cavity by coughing. I have noticed that the patients on whom I have operated under local anesthesia were extremely apprehensive and although the pain suffered may have been very slight, yet the mental anguish that they went through was not good for them. The question often comes up as to whether or not there is any danger in using large amounts of novocaine. This is a difficult question to answer. Chemists believe it is impossible to get any toxic effects from novocaine. On the other hand surgeons have reported fatalities that they believed were due to this. The only patient I lost may have died from this. He was a young man in the thirties and in rather poor condition. The operation was done entirely with local anesthesia, which was perfect, in that there was absolutely no pain and I could operate just as if the patient was under a general anesthetic. After resecting sections of only three ribs his condition became alarming, so much so that the operation was quickly stopped and the patient returned to his room, where within half an hour he died. Of course the time of operation is much shortened by the use of a general anesthetic and I think this is well worth consideration. At the present moment, I am inclined to use gas oxygen in all these cases, but in certain instances do the lower part of the operation under local anesthesia.

It is well to have the patient under close observation in the hospital in which the operation is to be performed for a few days preceding operation. I believe this is a good rule to follow in spite of the fact that most patients come from a sanatorium in which a careful record of their case has been kept. The course of the temperature, respiration, and pulse should be known, also the amount of sputum and the blood pressure. When this latter is 120 or 125 systolic operation will probably be comfortably stood. A lower pressure, however, is not necessarily a contraindication to operation, if done in two or more stages. Cavities should be emptied by postural drainage before operation, especially if a general anesthetic is to be used.

Sauerbruch's operation consists in removing posterior sections of 11 ribs, including the 1st and the 11th. There is some difference of opinion as to just how this should be done. In certain patients this whole procedure could undoubtedly be safely done in one sitting; on the other hand, in many instances this would be more than the patient could stand. Therefore no absolute rule as to this should be laid down. However, if forced to make a definite statement, I should say, at the present time, that I shall always do this operation in at least two stages. I know this is the safest procedure. I realize well that few patients like to look forward to two or three operations, but the surgeon should not be influenced by this. I formerly believed, when using local anesthesia entirely, that this should be done in one stage when the condition of the patient seemed to justify it, and I want to add that in those cases in which the operation was completed in one sitting I never had cause to regret having done this; but at the present time I am inclined to be more conservative, especially as I am using a general anesthetic more and more. Whether the operation should start at the upper ribs or at the lower ones seems to be somewhat of a question. Lambert and Miller[3] and also Lilienthal[4] are in favor of beginning with the upper ribs on the grounds that there is less danger of aspiration pneumonia. On the other hand, other authorities advocate the removal of the lower ribs first for exactly the same reason. Personally I can argue equally on either side of the question. I really feel that the technique used should depend entirely on the individual case and that no exact policy should be laid down that would govern all cases. In general it may be said that the upper part of the operation is the more difficult and so this may be a good reason for doing it first. When this is done sections of ribs should be removed in the following order: 3rd, 2nd, 1st, and then 4th, 5th, 6th, etc. I have operated by both methods and to date have not had any case develop symptoms of aspiration pneumonia. It may be reasonable to suppose that in certain cases section of the 1st rib or the 11th rib is not necessary, but it is probably true that a better collapse is brought about sectioning these two ribs, and indeed many surgeons believe that the success of the entire procedure depends upon this being done. I have not been impressed with the injection of the intercostal nerves with alcohol for relief of post-operative pain, and have largely given it up at the present time. If sections of the 9th, 10th, and 11th ribs are removed I believe the movement of the diaphragm is as completely destroyed and its ascent is as great as when the phrenic nerve is removed. This, however, does not entirely agree with some other surgeons. Alexander[3] has advocated the avulsion of the phrenic nerve and then later the removal of sections of the upper 7 ribs only. I believe it is much better to do the complete

operation. More collapse will be obtained by taking out longer sections of ribs than shorter ones, and it should be remembered that if the disease is not extensive enough or the lung is not fibrotic enough to stand more or less firmly by itself that in taking out too long a section of each rib a mediastinal flutter with consequent heart embarrassment and failure may take place. Therefore the length of the rib to be removed must be determined at the time of operation when the operator can see what kind of lung he is dealing with and how it is acting.

Lilienthal[4] states that "the diminution in size of the thoracic cavity, following thoracoplasty, is due more to the artificial obliquity of the ribs than to the amount of bone removed. The action being very much like a Venetian blind—when one drops they all tend to; but if the first rib is not divided it acts as a support to those below."

The cut muscles should be carefully sutured and all bleeding checked. The only drainage I have ever used is a long strip of Miller wicking that reaches nearly to the top of the wound from the bottom. This is to take care of the serum that collects. Other surgeons advocate more drainage than this. The arm should not be used too much for the first few days, but after that I think the patient should be allowed to use it about as much as he wishes. Pain will limit too much motion of the arm.

Some patients have considerable shock following operation whereas others have very little, but all, I think, should be treated as if they did have it. Just how long one should wait between stages of the operation is a matter of opinion. I feel that two weeks is about the right length of time; on the other hand some surgeons prefer to do the second stage at the end of the first week, and then, again, some medical authorities advocate waiting three weeks. Occasionally I have waited longer than two weeks and, indeed, three months in one case, although I do not believe that waiting so long is ideal.

Formerly I had a special harness made to compress the chest wall after the wound was well healed, but now I do not believe this to be necessary as the muscles tend to draw the ribs more and more towards the vertebral column. The full effect of sectioning the ribs, in reducing the size of the chest cavity, is not reached for from 6 to 12 months after operation.

It has been my experience that following the first stage of the operation there has been little change in the patient's symptoms. There is still apt to be cough and fever, but after the whole operation is completed there is a very decided change for the better within a week in those cases in which the operation is surely going to benefit. The cough lessens very much or disappears, the temperature stays down to nearly normal, and there is a general sense of improvement and well being noticed by the patient himself.

Apicolysis, in which the apex of the lung is compressed, may be a very useful operation when there is a large cavity at the apex and little disease elsewhere. But when there is disease in the rest of the upper lobe and also in the lower lobe, a thoracoplasty should be done first, and if this does not collapse the cavity, apicolysis might well be done. In this operation sections of the 2nd, or 2nd and 3rd ribs are removed anteriorly and the apex of the lung is pushed downwards extrapleurally. The space at the top of the chest created by this procedure should be filled with muscle or fat. If muscle is to be used flaps should be taken from the pectoralis major and minor. It seems probable that although the muscle flap will completely fill this space at operation, yet as time goes on it will atrophy a certain amount and thus cause the compression of the lung to diminish. Fat may be taken from the abdominal wall or buttocks. If the patient happens to have a lipoma this would be convenient. Gauze is advocated by some surgeons, but this does not appeal to me on account of the probability of infection. This operation might well be used in certain cases of bilateral cavities at the apices—but both sides should probably not be operated upon at the same sitting.

I have had no experience with Jacobaeus' method of cauterizing adhesions between the lung and the costal pleura. In some cases a complete collapse of the lung cannot be brought about by artificial pneumothorax on account of adhesions. Using an instrument with a light, much like a cystoscope, through a small opening in the chest wall, these adhesions are seen and cut with a cautery. The technique does not appeal to me as there is too much danger of hemorrhage and infection. If it is necessary to cut adhesions an operation in which they can be seen, picked up, cut and tied, seems safer surgery.

The results of surgery are to my mind amazing when one considers the poor condition these patients are in. It is remarkable that the immediate mortality is not much larger than it is. My own, 7%, is too high. Out of 13 cases I lost the one I mentioned, possibly from the novocaine. A mortality of 4 or 5% is probably about what should be expected. Archibald's mortality is about 4%. Lord[5], in quoting Sauerbruch's statistics, says that of 116 cases operated upon, 11% died during the first four weeks. The statistics of the early and late results are valuable but not interesting to go into too deeply, and I purposely have avoided them, as they are easily looked up. Unfortunately, a patient reported doing well today may be dead six months from now and one reported doing poorly may be almost well a year later. A pa-

tient who has been running a high evening temperature of 103 or 104, within a few days of the completion of the operative procedure may have a normal temperature all the 24 hours. One that has been coughing a great deal and raising 8 or 10 ounces of sputum each 24 hours suddenly finds that he has no cough and no expectoration.

John Alexander[3] has collected 1,024 cases, mostly those of European surgeons. The results are roughly as follows: One-third have been cured, in that they are free from any symptoms of tuberculosis activity for at least one and one-half years, no sputum or none containing tubercle bacilli, and are able to do a whole day or a part day's work. One-third have been improved or considerably improved, and finally the remaining third is made up of those cases in which there was no improvement or which were made worse by the operation, and the patients still under treatment or not traced. The results of American surgeons are very similar to those of European surgeons.

REFERENCES

1 Meyer, Willy: Arch. of Surg., Jan., 1925, p. 338, discussion.
2 Whittemore, Wyman: Thoracoplasty in Advanced Pulmonary Tuberculosis. Boston Med. and Surg. Jour., Sept. 17, 1925.
3 Alexander, John: The Surgery of Pulmonary Tuberculosis. Am. Jour. of Med. Sci., July, Aug., Sept., Oct., 1924.
4 Lilienthal, Howard: Thoracic Surgery, 1925.
5 Lord, F. T.: Diseases of the Bronchi, Lungs, and Pleura.

Discussion

Dr. Frederick T. Lord, Boston: Much has already been said today about rest in the treatment of pulmonary tuberculosis. There has been an increasing tendency to prescribe longer and more complete bed rest in the treatment of this disease from the time of Dettweiler to the present. The success of this policy led to the experimental trial first of artificial pneumothorax and more recently of thoracoplasty as mechanical means of promoting still further immobilization of the affected lung. There is experimental evidence in support of such mechanical treatment in the investigations by Rubel, who infected animals intravenously after operative immobilization of one lung and found that the tuberculosis ran a more chronic and benign course in the relatively immobile lung.

Regarding pneumothorax, sufficient time has now elapsed for the accumulation of data on the merits of this procedure. There are many reports in the literature of favorable results in small groups of cases, but for the most part these are open to the criticism that there is lacking any strictly comparable group of cases to serve as a control in estimating the value of the method. Fortunately the statistics published by Saugmann and by Matson and his associates not only deal with a large number of cases, but also make it possible to compare the results obtained by lung collapse in one group with those in another otherwise similar but not so treated. The results in cases treated by artificial pneumothorax are so much better than the results in the control group in those two series as to leave no doubt as to the value of this method of treatment.

Regarding thoracoplasty, a relatively new procedure, it is surprising to find in how large a number of cases it has been done. Alexander in his recent book refers to about 1,200 cases in which thoracoplasty has been done for pulmonary tuberculosis in Germany, Switzerland and Scandinavia. The operation has been performed on 300 cases by 17 United States surgeons. Sauerbruch up to 1925 has operated on more than 800 cases of pulmonary tuberculosis and in a great majority by thoracoplasty.

With respect to the indications for operation, it is generally conceded that thoracoplasty is applicable to the more severe types of unilateral pulmonary tuberculosis after the unsuccessful trial of other methods including artificial pneumothorax, if that is feasible. An important matter in the selection of suitable cases is a technically satisfactory radiogram, neither over- nor under-exposed and without respiratory motion in order not to miss the presence of lesions on the other side. The pulmonary tuberculosis should be limited to one side or if bilateral must be of slight extent and non-progressive or arrested and in the upper lobe above the lung root and without cavity formation on the least affected side.

How are we to tell whether the lesion on the least affected side is progressive or not? Constitutional reactions are likely to be present from active disease on the most affected side and are therefore of no value in the estimation of activity of the lesions on the least affected side. Obviously one way is to wait and compare the initial physical and x-ray findings with those after the expiration of several months. The persistent presence of moist rales over the areas in question may be taken as an indication of activity. Their absence, however, does not exclude activity, as no rales may be heard after careful and repeated examinations and the tuberculous process may still be active. Some evidence, as Miller has said, may be obtained regarding activity by the character of the areas of increased density on the radiographic films. Those shadows which present a "cottony", filmy appearance with ill-defined margins are in general to be regarded as due to active disease, while dense, discrete and sharply defined shadows probably represent inactive lesions. It would on the whole seem wiser, however, to rely on the test of time rather than on such physical and radiographic findings in the attempt to settle this question. In doubtful cases the performance of phrenicotomy on the most affected side is a useful preliminary expedient, as it enables the observer within a few weeks to determine the effect on the opposite lung of a

slight amount of additional work, pending a decision regarding the performance of thoracotomy.

In the performance of the operation the results have in general been better when it is done in more than one stage. The one stage operation is accompanied by a greater amount of shock and a more rapid emptying of exudate containing tubercle bacilli into the air passages. I was impressed in this connection with the case to which Miller referred, with the development of tuberculosis on the unoperated side after operation. The introduction into the bronchi of fluid opaque to the x-ray throws some light on the mechanism of its production. Radiographic examination of patients after bronchoscopic introduction of lipiodal into the bronchi on one side not infrequently shows that shortly thereafter there is an accumulation of this substance in considerable amount on the other side also. This redistribution of the material is doubtless due to its expulsion by cough from its original site and aspiration into the other lung. The thoracoplastic compression of an extensively tuberculous lung by a one stage operation is attended by the risk of rapid flooding of the bronchi with infected material and its aspiration into previously uninvaded regions. The more gradual the compression the less the danger from this source.

Concerning the published results of operation, Whittemore quoted Alexander's collected statistics and called attention to the undesirability of the use of the term "cure." Medical men have long since learned to be cautious in the application of this term in recording their results in the treatment of pulmonary tuberculosis and we rebel a little at its use by the surgeons who now tell us of "cures" with the knife when the best we can do without it is to "apparently cure" or "arrest" the disease. But it should be appreciated that in their hands this instrument has produced results little short of marvelous in dealing with an otherwise almost hopeless group of cases in the more advanced stages of the disease.

Alexander's statistics deal with 1,159 cases treated by thoracoplasty and of this number 36.8 per cent. were "cured". This implies freedom from any symptoms of activity of the tuberculous process for at least one and one-half years, absence of sputum and ability to perform a full day's work. In addition 24.4 per cent. were improved, giving a total favorable result in 61.2 per cent. The striking character of these surgical results in the more advanced types of pulmonary tuberculosis can be appreciated by a comparison with the results from sanatorium treatment in positive sputum cases after about one to five years. Of 357 moderately advanced cases in Bardswell's series, 137 (38.3 per cent.) were dead and of 224 advanced cases 160 (71.4 per cent.) were dead. The comparison is not wholly acceptable on account of some uncertainty as to the type and severity of the cases in the surgical series and a difference in the time factor in the two groups, but in spite of these objections the results are strongly in favor of surgery. Mass statistics, however, are unnecessary to establish the value of thoracoplasty. The almost constant and rapid improvement in individual cases after the application of this method of treatment is sufficiently convincing of the merits of the procedure.

Dr. Harry L. Barnes, Wallum Lake, R. I.: First I may say a few words in regard to artificial pneumothorax, which Dr. Miller covered so well. If a patient has unilateral disease with severe symptoms we are apt to start the treatment very soon; on the other hand if the symptoms are not severe and the temperature not over 100 we are inclined to wait a few weeks and watch for the appearance of rales or x-ray evidence of extension of the disease in the good lung. Sometimes we see a marked extension in the good lung and we give up the idea of pneumothorax as being hopeless. At other times the temperature subsides entirely and the patient recovers without pneumothorax. Operators who induce the pneumothorax promptly will get apparently better results because they will save some patients who would have recovered any way.

Regarding Dr. Whittemore's paper, when your Chairman invited me to take part in this discussion I told him that I did not consider myself qualified to discuss the surgical technique of the operation but that I would be glad to present one of our patients. This man is 36 years old. He came to the Sanatorium on August 16, 1922, with a lesion of the upper half of the left side. He was running an evening temperature of 100 to 101 and had positive sputum. After three or four months of bed rest which only partially reduced the temperature, he consented to pneumothorax, which was given by Dr. Rosenblatt on December 9. Fluid developed in the left pleural cavity the following August and was occasionally replaced by air. The next March the patient left the Sanatorium. He had gained 18 pounds, was fever free and tubercle bacilli had left the sputum. He was away for a year, during which he spent some time in England, and he returned in March, 1925. He was running a temperature of 100, which subsided with bed rest. On the 10th day of May he had a hemorrhage of 50 ounces. The next day he had a hemorrhage of 45 ounces. That was practically three quarts in two days. He had more hemorrhages in the next month and lost 3½ quarts of blood altogether. We then secured his consent to do a thoracoplasty, and Dr. Lilienthal of New York, on July 25, did the first stage of the operation,

resecting the first five ribs. He was given 600 c.c. of whole blood by transfusion immediately after the first operation. Nine days later he did the second stage—sixth to eleventh ribs inclusive.

DR. J. A. MILLER, New York: Had the fluid all absorbed?

DR. BARNES: It had nearly, or quite all, absorbed.

DR. BARNES (showing x-ray films): Film 1—This shows an extensive lesion in the upper half of the left lung with cavity formation. Film 2—Taken four months after admission, shows that the disease had extended in the left lung. Film 3—Taken in September, 1923, shows pneumothorax at the left base. Film 4—Shows the lesion on July 3, 1925, shortly before the operation of thoracoplasty; and Film 5 was taken on August 19, following thoracoplasty. Film 6—Taken last January, shows the collapse of the left chest after the operation.

Four days after the second operation all expectoration ceased and the patient in the next ten weeks gained 20 pounds and went to normal weight. He is now 17 pounds above normal weight, and had been symptom-free ten and a half months.

QUESTION: How many centimeters of ribs were taken out?

DR. BARNES: About 12 inches of ribs were taken out at the first operation, but I have no record of the amount resected at the second operation.

QUESTION: Is he working now, doctor?

DR. BARNES: No he isn't working yet. We advised him not to work for two years, as a precaution against relapse.

A MEMBER: I would like to ask Dr. Whittemore what his attitude would be towards tuberculous empyema—whether he would recommend operating upon them by thoracoplasty.

DR. WYMAN WHITTEMORE: You mean when a case has a persistent sinus?

A MEMBER: Yes.

DR. WHITTEMORE: Yes. I think that thoracoplasty offers the best solution for that.

DR. J. H. PRATT, Boston: It seems to me Dr. Miller has presented evidence of the value of artificial pneumothorax in the treatment of pulmonary tuberculosis that is absolutely convincing. I do not see how anyone can leave this room without a real regret that he has not used artificial pneumothorax in more cases and that he did not use it earlier.

I have a strong impression, based, it is true, only on the study of a few cases, that renewed activity is less apt to occur after treatment by artificial pneumothorax in addition to bed rest than when bed rest alone is employed. It would seem natural that scar tissue formed about tuberculous areas in a compressed lung would be firmer than in a lung not kept at complete rest.

I have been particularly impressed by the record of a girl in my tuberculosis class who was given artificial pneumothorax by Dr. Balboni. An advanced case when admitted in April, 1911, two years of rest treatment had not arrested the disease. Treatment by artificial pneumothorax was begun in August, 1913. She at length recovered and returned to work in October, 1915. Her life has since been an arduous one but she has never had a return of the disease and when I examined her last in January, 1926, she was in excellent condition.

If artificial pneumothorax is such a good procedure in advanced tuberculosis it seems to me logical to use it earlier in the disease. It increases the probability of recovery and it should shorten the duration of treatment by giving more rest to the lung and better opportunity for healing.

I wish Dr. Miller would tell us the number of cases in which he has done bilateral pneumothorax. In one of our patients, a far advanced case, Dr. Balboni produced artificial pneumothorax on the right side of the chest in July, 1920. In April, 1922, compression of the left lung was undertaken. He recovered sufficiently to go to work in June, 1923. Later he went to South America and when I last heard from him, about a year ago, he was still working.

DISCUSSION OF PAPER OF DR. JAMES A. MILLER*

EDWARD O. OTIS, Boston: Rest has been the everlasting cry of man; as the old hymn goes, "How can rest be found; rest for the weary soul?" And only when the soul has taken its flight do we inscribe upon the tombstone: "He is at rest." The search for rest, both for soul and body, seems almost as elusive as was Sir Galahad's search for the Holy Grail.

Dettweiler many years ago in his then novel "rest cure" at Falkenstein, and in later years Dr. Pratt by his striking results obtained through long, continued rest, taught us the supreme value of rest in the treatment of pulmonary tuberculosis. But how to obtain rest for the diseased lung as well as rest for the body was an insoluble problem. Rest of the body when active symptoms existed was comparatively easy to obtain, but how to obtain rest so needful for the diseased lung no one could say, and the problem remained unsolved until fifteen or more years ago, as Dr. Miller says. One must breathe and in the act of respiration both lungs take part. We knew of no way of shutting off one lung. Again the consumptive coughs more

*NOTE:—Dr. James A. Miller's paper is not available for publication.

or less, and this act increases the respiratory movements; in coughing he has to inspire deeply in order to obtain the "vis a tergo" for the expiratory cough. Attempts were made to restrict the movements of the chest by strapping and other devices just as at the present time various jackets have been devised for this purpose, as well as lying on the affected side, as suggested by Dr. Webb, or by limiting the number of respirations, as advocated by Dr. Knopf. All these measures, however, affect but little the movements of the lungs inside the chest, which move and must move with every act of inspiration, and thus greatly interfering with, if not preventing, the healing of the diseased lung.

The problem of securing complete immobilization was finally solved by Murphy in this country, and popularized by Forlanini of Pavia in Italy, by the method which we know as artificial pneumothorax. These pioneers demonstrated the fact that air or an innocuous gas could be injected into the pleural cavity when it was free from adhesions without danger, and by this simple expedient the lung could be compressed and thus placed at rest and given the most favorable opportunity for healing. At last the long desired object was obtained and artificial pneumothorax is now an accepted method of procedure for suitable cases in all well ordered sanatoriums, and by this means thousands of lives have been saved which were otherwise doomed.

But unfortunately many or most tuberculous lungs are accompanied, as we know, by disease also of the pleura which causes adhesions, and consequently prevents the gas from compressing the lung. Again the problem seemed insoluble, but again it was solved by the operation of thorocoplasty, which Dr. Miller has described, introduced by Sauerbruch and Brauer of Germany and Sangman of Denmark, and this operation has now become an established procedure in selected cases, and its practice is increasing daily. The results are excellent, as Dr. Miller tells us. The operation itself as I have seen it seems almost brutal, but as a rule there is not much shock and convalescence is rapid after such an extensive wound. Surgeons are acquiring the necessary technique, although in this part of the country this operation seems to be of slow growth.

Of course the compressed lung after thorocoplasty is ever after useless; the operation, as Alexander says, constitutes a "physiological amputation." The contralateral lung must thereafter do all the work of respiration and therefore its integrity must be assured. The percentage of patients suitable for thorocoplasty is given by Alexander as from three to five per cent. Some authorities give a higher percentage. Before considering this operation artificial pneumothorax should first be tried. When this has failed and the ordinary open-air treatment has been continued for a long time without improvement, and the result seems dubious, then thorocoplasty is to be seriously considered if the general condition of the patient is relatively good and the contralateral lung sound or nearly so.

At all events, one who treats cases of pulmonary tuberculosis should be well informed as to these two life-saving measures, artificial pneumothorax and thorocoplasty, and be ready to suggest or advise them if the usual open-air method seems likely to fail after a continued trial. It must always be borne in mind that thorocoplasty is an operation of magnitude and the issue is not always favorable so that under these limitations many patients will not, or have not the courage to submit to it.

It requires experience to determine just what are suitable cases for thorocoplasty but in general one can say they are cases of advanced slowly progressing disease, confined to one lung, and good or fair general condition.

While we are awaiting the long desired and sought for specific for pulmonary tuberculosis, if indeed it ever come, it is well for all of us to bear in mind the supreme importance of rest, both for the body and the affected lung. With our present knowledge rest is the nearest approach to this elusive specific which we possess, and it is a wise rule in treating pulmonary tuberculosis, when we are in doubt as to whether rest is indicated or not, to prescribe rest.

JOHN B. HAWES, Boston: There can no longer be any question in view of what Dr. Miller and indeed many others have said on the subject concerning the value of pneumothorax in the treatment of pulmonary tuberculosis. Pneumothorax is no longer in the trial stage. It has been definitely proven to be an agent of great value in a certain percentage of cases. The question of giving pneumothorax to our patients in Massachusetts and certainly around Boston depends not so much as to whether or not it is indicated or will prove of value to them but whether, first, the patient can be persuaded to accept this form of treatment; second, whether a doctor can be persuaded to give it or a doctor found who is capable of giving it without harm or danger; third, whether adequate hospital or sanatorium facilities can be found where it can be given under proper supervision; and finally, whether the patient can afford it.

Both the medical profession and the public at large in Massachusetts have a very real conservatism concerning anything which is new in medicine and each group must be educated up to the point of accepting such a comparatively new form of treatment as pneumothorax. This is a very real problem. I frankly have been very conservative and I now believe, hyperconservative in regard to it but at last am thorough-

ly convinced. My patients are not yet convinced but I hope in the course of time that they will be.

These two questions, however, are not so hard to manage as the one which confronts us in regard to the attitude of our general hospitals toward the reception of patients with tuberculosis for observation, diagnosis and treatment such as pneumothorax. The Massachusetts General Hospital has been for years and still is archaic in its attitude in this respect and I know of no other general hospital in or around Boston where one can send a patient for pneumothorax treatment (and I feel that the vast majority of patients should be in a hospital or sanatorium when they first receive pneumothorax) unless one chooses to deliberately lie about the diagnosis. Dr. Whittemore has told me that the Massachusetts General Hospital will receive tuberculosis patients for operation but this, however, does not help the situation. What I hope in time we will have are facilities in every general hospital either in private rooms or special wards where patients can go in for observation, diagnosis, disposal and special treatment such as pneumothorax. Until such a time arrives, the problem of giving pneumothorax to patients in the poorer and ordinary circumstances as far as Boston is concerned at least will be a very difficult one.

DR. O. S. PETTINGILL, Middleton, Mass.: Our experience at the Essex Sanatorium practically coincides with Dr. Miller's in his selection or rather in his type of case for artificial pneumothorax, although we haven't had very good results in the acute pneumonic type. Perhaps we have waited too long in these cases. Then, too, we have been credited with activating or producing tuberculous enteritis by inducing artificial pneumothorax on cases that had very few symptoms of enteritis before this treatment.

The real skill in this whole procedure comes in selecting the proper type of case and when to do it and when not to, as well as when to call in the surgeon for his work.

DR. E. O. OTIS, Boston: I would like to ask Dr. Miller what he thinks of the ordinary general practitioner who sees an average number of tuberculous cases—whether he should attempt an artificial pneumothorax himself or whether he should refer it to a sanatorium or hospital.

Continuing, DR. WHITTEMORE said: At the Massachusetts General Hospital in the last five or six years they have always been ready and willing to let any case of pulmonary tuberculosis come into the hospital that was suitable for surgery, the others, of course, they have not.

ORIGINAL ARTICLES

LUMBO-SACRAL BACKACHE*

BY CHARLES E. AYERS, M.D., F.A.C.S.

THE investigation of the causes of low back pain including sciatica have recently led to work upon the lumbo-sacral joint. Noteworthy contributions by Hibbs in 1922 on painful back following injury, and more recently Von Lackum's article consisting of the anatomical findings in 38 dissected specimens, tend to show that this joint, between a movable spine and a more or less fixed pelvis, is subject to considerable strain and injury. In the normal individual the pelvis is tilted forward to an angle of approximately 60 degrees with the ground. This tilting forward carries with it the superior surface of the sacrum, and results in a lordosis or forward arching of the lower lumbar spine, gradually swinging backward as we approach the dorsal region to reëstablish the weight-bearing line. In the normal spine the greatest proportion of weight bearing is upon the bodies of the vertebrae and sacrum.

In the spine with excessive lordosis and marked forward tilting of the sacrum it is quite evident that the greatest strain is thrown upon the articular facets and consequently there is a constant tendency for the deformity to increase. The articular facets are very marked in the lumbar region and aid greatly in establishing the security of these vertebrae. The transverse and spinous processes are merely controls for muscle attachment. As this joint is the site of considerable action and great strain it is not unusual to find arthritis in this region, and the following cases are cited:

CASE 1. J. B. Age 35. About a year previous to admission he fell a distance of 20 feet. He suffered no ill effects until about two months before admission, when his back began to pain him. Pain became so severe at times that he was hardly able to walk across the room. He received anti-rheumatic treatment which gave him relief for a short time, but it recurred more severe a short time later. On examination his back motions were limited in all directions. There was an exaggerated lumbo-sacral angle with marked tenderness of the lumbo-sacral joint. X-ray pictures show complete obliteration of the cartilaginous disc between the 5th lumbar and the sacrum.

CASE 2. M. G. Age 28. Chief complaint—Pain in

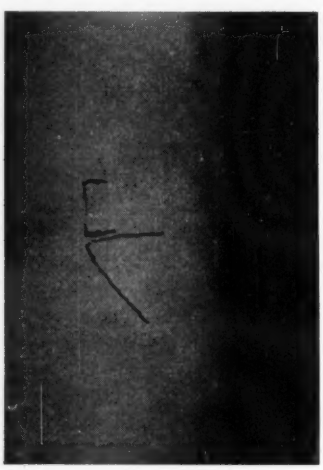
*Delivered at joint meeting of Franklin and Hampshire Counties Medical Societies at South Deerfield, August 11, 1926.

the back extending to the left hip. About six months previous to admission he began to suffer pain and stiffness in the lower lumbar region. Three weeks later pain went into the left hip and leg. Patient was in bed for seven weeks at this time. Improved somewhat after rest, but a short time pain recurred and a plaster cast was applied. Pain was relieved by spica cast, but he suffered a relapse after its removal. X-ray picture shows marked thinning of the cartilaginous disc at its posterior angle.

CASE 3. A. A. Age 42. Patient has had trouble with his back for the past eight or nine years. At-

CASE 1. Shows deeply set 5th lumbar, marked haziness at lumbo-sacral junction. Lateral picture, not shown here, reveals almost complete destruction of lumbo-sacral cartilage.

tacks have been very severe and almost unbearable in character. During the attack he has been obliged to remain in bed for weeks at a time. His examina-

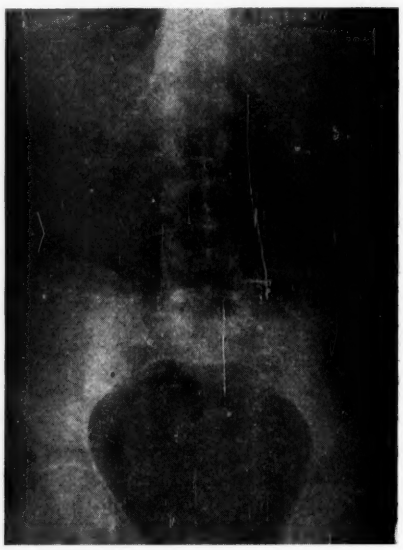


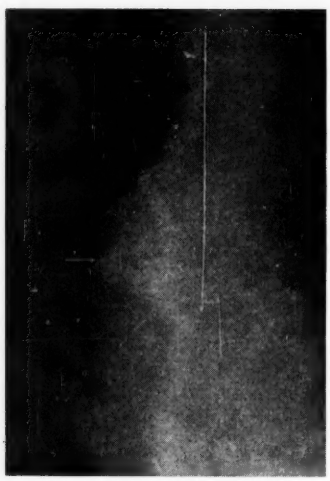
CASE 3. Lateral view (retouched) shows broad sacrum with almost complete destruction of lumbo-sacral cartilage.

tion showed back motions were limited in all directions with positive straight leg raising on the right side and marked tenderness at the lumbo-sacral junction. X-ray pictures show a very broad sacrum with almost horizontal superior surface, but the cartilaginous disc has been nearly destroyed.

CASE 4. M. H. Age 36. Chief complaint—Pain in the back extending down left leg.

History—Patient has suffered for a year with sharp pain in the back extending to the left hip and leg, which is aggravated by work. Attacks may last from one day to several weeks at a time. A plaster cast was applied with some relief, but pain recurred after its removal. Examination showed exaggerated lordosis with marked tenderness at the lumbo-sacral junction. There was also some tenderness over the sacro-iliac joints. X-ray pictures in the antero-posterior





CASE 4. Shows antero-posterior and lateral views with exaggerated lumbo-sacral angle.

view show tilting of the 5th lumbar slightly to the right side. The transverse processes are well within the wings of the sacrum. The sacro-iliac joints appear normal. In the lateral picture the superior surface of the sacrum is almost perpendicular. The cartilaginous disc appears hazy and there is considerable proliferation of bone.

CASE 5. A. S. Chief complaint—Pain in the right thigh and leg. Pain is sharp and intermittent in character, being more troublesome when standing on his feet. Has had similar trouble three years ago which lasted for about three weeks. It is much more severe at the present time.

Examination showed positive straight leg raising with marked tenderness over the sacro-iliac joints. X-ray pictures show complete fusion of the sacro-iliac

joints on both sides. There is a bony exostosis extending up from the spine of the sacrum to almost direct contact with the spinous process of the 5th lumbar. This is also noticeable in the lateral view.

CASE 6. Alfred A. Age 56. Chief complaint—Pain in the back which extended down the calf of the left leg.

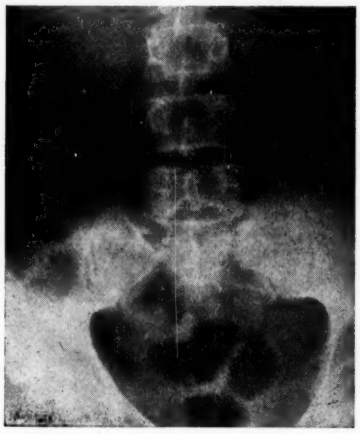
History—Three months ago he strained his back while lifting a heavy weight. He felt a sharp pain and was obliged to give up work for one week. He then went back to work but suffered more pain and was obliged to give it up two weeks later. At present he is able to walk only short distances because of pain. Examination showed marked limitation in all back motions and marked tenderness at the lumbo-sacral angle radiating to the left side. X-ray shows marked periosteal proliferation in the region of the transverse processes, and sacrum. There is apparently beginning ankylosis between the two. Lateral view shows marked exaggeration of lordosis, and the superior surface of the sacrum and the 5th lumbar are tilted sharply downward.

CASE 7. L. G. Age 35. Chief complaint—Pain in the lower back. Patient has had difficulty in sitting straight or getting up from the sitting position. Trouble has been coming on for about two years. At present he is a salesman, but previously worked in a mill, doing considerable lifting.

Examination showed marked limitation in all back motions, with marked tenderness over the lumbo-sacral angle. The antero-posterior picture shows complete obliteration of both sacro-iliac joints. In the lateral picture there is marked erosion of the cartilaginous disc, with beginning proliferation of bone at this joint.

CASE 8. Age 37. Chief complaint—Pain in the lumbar region running down the back of his legs.

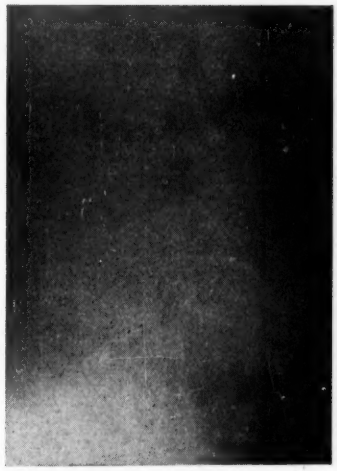
History—He suffered an injury to his spine in falling six years ago. Since then has had attacks of pain in the lower back which have been very severe at times. Complains that when he works hard and bends over he finds it almost impossible to straighten up.



CASE 8. Shows beginning ossification of lumbo-sacral ligaments.

Examination—Patient was seized with a sudden attack of pain on entering the office and fell to the floor. There was a marked list of the spine with back motions limited in all directions. Antero-posterior X-rays show sacro-iliac joints normal; transverse processes of the 5th lumbar vertebrae are abnormally wide but do not impinge. There is, however, beginning ossification of the lumbo-sacral ligament on both sides. Lateral picture shows nothing abnormal.

CASE 9. Age 59. Patient has suffered from pain of the back and sciatica for several years. It has been particularly severe the last few months.



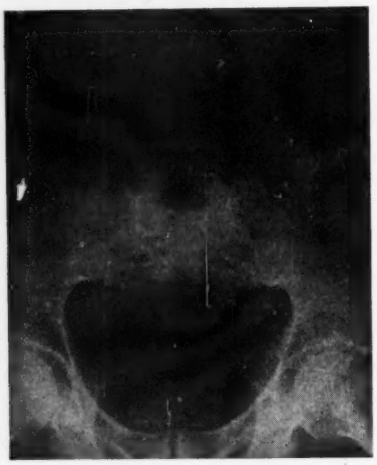
CASE 9. In the antero-posterior view shows deeply set 5th lumbar vertebra with marked haziness of lumbo-sacral cartilage. In lateral view this cartilage is apparently destroyed. and there is beginning ossification tending to unite the 5th lumbar vertebra to the sacrum.

Examination showed marked limitation in all back motions with positive straight leg raising on the right side. X-ray pictures show normal sacro-iliac joints, but the 5th lumbar vertebra is apparently very crowded with relation to the ilia and sacrum. In the lateral view the intervertebral cartilage is almost entirely obliterated.

CASE 10. Joseph W. Age 50. Chief complaint—Pain in the lower back. Has had pain in the lower back for the past six years. During attacks he is bent over to one side.

Examination showed all back motions limited, with slight list to one side. The antero-posterior picture shows marked crowding in region of the 5th lumbar, with increased density in the region of the articular facets. There is apparent proliferation of periosteum at the junction of the transverse process of the 5th lumbar to the wing of the sacrum on the left side. Right side appears atrophied. Lateral view shows marked haziness and obliteration of outline in region of articular facets.

CASE 11. A. S. Age 38. Chief complaint—Pain in the back extending down both legs.



CASE 10. Deeply set 5th lumbar vertebra with beginning union of the transverse processes to the ilia.

History—Has suffered with lumbago for the past several years. Passed the winter last year in Bermuda, hoping that the warm climate would improve this condition. Pain continued. Attacks are very severe at times, during which the pain is almost unbearable.

CASE 11. Marked haziness at lumbo-sacral junction. Lateral view shows complete destruction of lumbo-sacral cartilage.

Examination showed marked limitation in all back motions, with marked tenderness at the lumbo-sacral junction. There is a positive straight leg raising test on both sides. Antero-posterior X-ray shows marked haziness between the 5th lumbar and the upper surface of the sacrum. Sacro-iliac joints appear normal, with no evidence of arthritis. There is a list of the spine to the left side. In the lateral view the cartilaginous disc is almost completely destroyed and there is a marked proliferation of bone along the antero spinal ligament. The body of the 5th lumbar is tilted downward into approximation with the sacrum.

Spondylolisthesis or forward slipping of the 5th lumbar vertebra has long been recognized but considered a very rare deformity. It probably results from the wearing away of the articular facets in a patient suffering with exaggerated lumbo-sacral angle, and in our short series of cases it would seem to be more frequent than has been supposed.

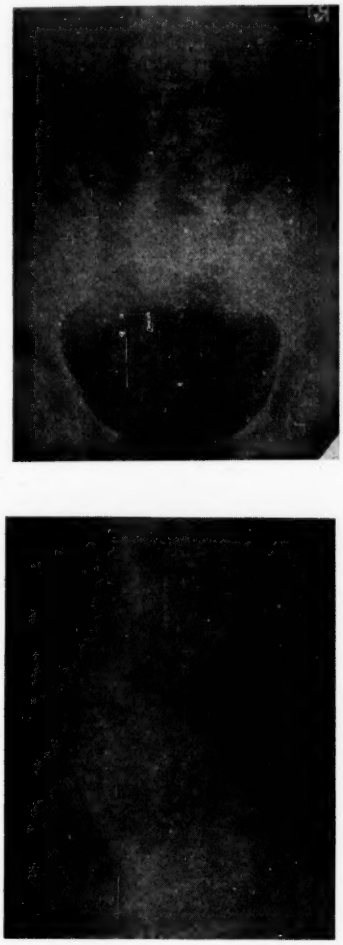
CASE 12. Age 51. History—Thirty years ago fell down stairs and was unable to lift herself afterward. Remained in bed for two years at home. Was perfectly well up to 18 years ago, when, following a fall down stairs, she was in bed for six months. After this accident she suffered stabbing pain in the lower back. Pain was aggravated by walking. Antero-posterior X-rays show marked enlargement of the sacral facets. The sacro-iliac joints are clear. In the lateral view there is marked exaggeration of the lumbo-sacral angle, with cup-shaped superior surface of the sacrum suggesting spondylolisthesis.

CASE 13. G. L. Age 28. Chief complaint—Severe pain in the lower back extending into left hip. Two years ago patient had severe pain in the back and he was told he had a sacro-iliac strain. Wore a cast for seven weeks and later a brace on for seven months, followed by a canvas belt. At this time the pain was more on the right side. Three weeks ago he had pain again, but this time it extended more to the left side.

CASE 13. Shows cup-shaped surface of sacrum as a result of forward slipping of the 5th lumbar vertebra.

Examination showed marked limitation and straight leg raising on the left side. There is tenderness over both sacro-iliac joints, but more marked at the lumbo-sacral junction. Sacro-iliac joints appear normal, but in the lateral view the superior surface of the sacrum is cup shaped, suggesting abnormal mobility of the 5th lumbar vertebra.

CASE 14. Age 68. Patient had sciatica for many years. Has always believed that the underlying cause was rheumatism. Examination showed marked list to one side, with obliteration of the normal lordosis in the lower lumbar region and exaggerated lordosis in the region of the 1st and 2nd lumbar.

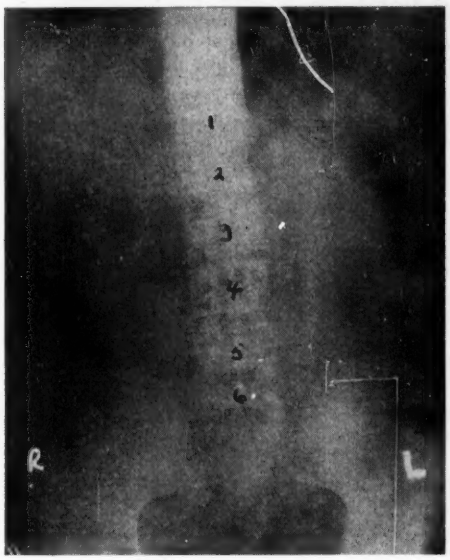


CASE 14. Shows peculiar crowding of the spinous process of the 5th lumbar vertebra with marked upward tilting of these processes. Lateral views show marked forward displacement of the 5th lumbar vertebra on the sacrum, with practically complete destruction of lumbo-sacral cartilage.

Antero-posterior X-ray pictures show sacro-iliac joints apparently normal. The bodies of the 4th and 5th lumbar vertebrae cannot be identified. The spinous processes of the 3rd, 4th and 5th are in direct contact. The lateral X-ray shows spondylolisthesis. The 5th lumbar vertebra has slipped off the sacrum fully one-half inch. The cartilaginous disc is practically destroyed. There is marked angulation of the spinal canal.

Abnormally large transverse processes of the last lumbar vertebra occurring most frequently in cases that have six lumbar vertebrae, which have been called sacralized, appear to have definite relation to back pain in this series of cases. Just why the pain has been delayed for such a long time after ossification has been completed remains obscure, but it probably is due to some strain or injury allowing greater mobility of this abnormal vertebra, causing irritation of the surrounding structures.

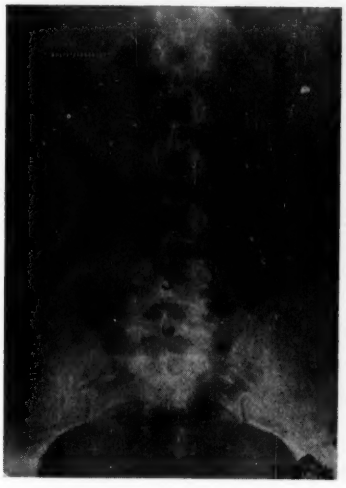
CASE 15. A. P. Chief complaint—Pain in the lower back and right hip. About three years ago began to have pain in the lower back.



CASE 15. Shows six lumbar vertebrae with sacralization of the 6th vertebra.

Examination showed moderate limitation of back motion with slight list to the right side. X-ray pictures show six lumbar vertebrae with marked sacralization of the transverse process of the right side.

CASE 16. A. B. Chief complaint—Pain in back. Patient was perfectly well until a few weeks ago, when she was involved in a trolley accident and was thrown to the floor. Had been examined and advised to wear a canvas belt. This, however, did not give her relief. X-ray pictures show six lumbar vertebrae.



The 6th vertebra has enlarged transverse processes on both sides, apparently in direct contact with ilia. The sacro-iliac joint appears normal, and in lateral view the 6th lumbar vertebra is tilted forward.

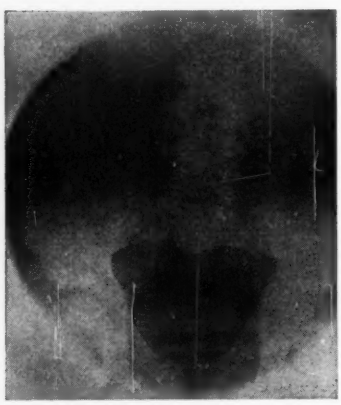
CASE 17. C. B. Age 12. Chief complaint—Pain in the lower back, with twisting of the spine. Examination showed limitation of back motion, with marked prominence of the right buttock in forward bending. Antero-posterior X-ray shows sacro-iliac joints normal, but there is marked deviation of the spine to

the left. The transverse process on the right side is sacralized. Left side appears to be free.

CASE 18. C. K. Pain in the lower back. A few years ago this patient had an abdominal operation consisting of ventral suspension of the uterus, but experienced no relief in her back symptoms. Since then she has consulted other physicians, who have

CASE 16. Shows six lumbar vertebrae and marked sacralization of the 6th. Lateral view shows abnormal position of the 6th lumbar vertebra in relation to sacrum.

suggested adhesions. She was referred for back examinations by her attending surgeon, who could find nothing pathological in the pelvis. Antero-posterior



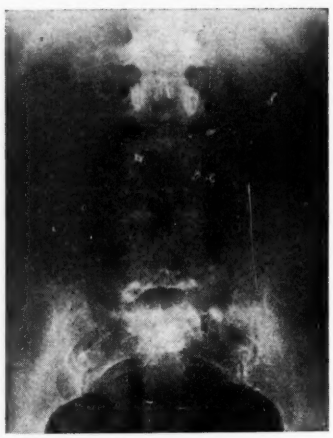
CASE 17. Shows sacralization of the last lumbar vertebra, causing curvature.

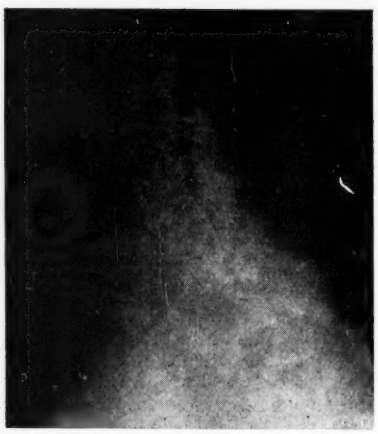
X-ray shows 6th lumbar vertebra. The transverse process of the 6th is completely sacralized on the left side. The right side is free. Lateral picture shows exaggerated angle at which the 6th lumbar vertebra is held. The cartilaginous disc is very thin.

CASE 19. R. B. Chief complaint—Backache and pain in right leg. History—For about five years has had occasional attacks of sharp pain in the lower back extending down the right leg. Occupation—Stationary fireman. Examination showed marked limitation in all back motions with marked tenderness over lumbo-sacral junction and both sacro-iliac joints. X-ray pictures show marked list of the spine to the left side. The sacro-iliac joints appear normal, but the last lumbar vertebra appears crowded. There is evidence of an exostosis extending up from the spine of the sacrum and appears to be touching the spinous process of the 5th lumbar vertebra. Lateral picture shows this exostosis. The cartilaginous disc between the sacrum and the last lumbar vertebra appears to be normal.

We have found a few cases in which the spinous processes on one or more vertebrae had grown abnormally large so that in the erect position, one of these spinous processes rested directly upon the one below it. Peculiar back symptoms resulted with radiating pain to the sides. These are treated by removal of a portion of the spinous processes that causes the impingement.

CASE 20. O. T. Age 38. Patient complains of pain in the back which radiated around the sides to the abdomen in front. Back motions were good except backward bending. This aggravated the pain. X-ray





CASE 18. Shows sacralization of last lumbar vertebra on one side only. Lateral view shows abnormal lumbo-sacral angle.

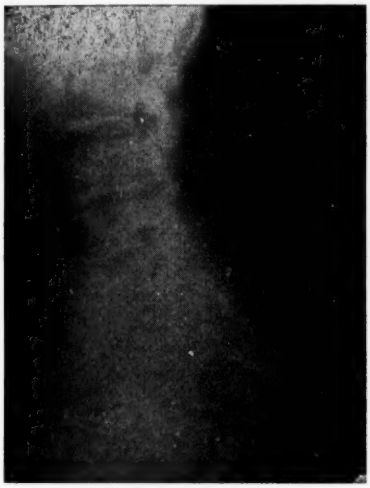
pictures show direct contact of the spinous processes of the 4th and 5th lumbar vertebrae.

CASE 21. L. K. Chief complaint—Pain in back. While lifting a heavy bundle of wire six months ago felt pain in the back. Has had plaster cast without relief. Has been told that he suffers with rheumatism. X-ray picture shows marked upward tilting of the spinous process of the 5th lumbar vertebra. In the lateral X-ray this spinous process is in direct contact with the spinous process of the 4th lumbar.

CASE 22. W. F. Age 42. Chief complaint—Pain in the back. History—Four years ago, while lifting

a heavy pattern box, he twisted back severely. Since that time he has had persistent examinations without relief.

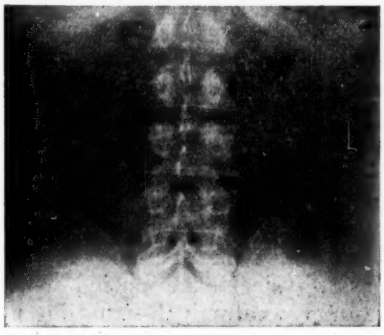
Examination shows forward bending slightly limited. Lateral bendings normal. Straight leg raising normal. There is distinct tenderness on deep pressure over the lumbo-sacral joint. X-ray pictures show nothing positive, but because of this man's continued disability it was decided to expose the lumbo-sacral region for diagnosis. Arising from the region of the spine of the sacrum an exostosis was



CASE 20. Lateral view showing contact between spinous processes of 4th and 5th lumbar vertebrae.

found extending up toward the lumbar vertebra, which caused pressure against spinous process of 5th lumbar when in erect position. Fusion of the lumbo-sacral joint was performed with marked relief in his symptoms.

A review of the physical findings and X-ray pictures in these cases shows that the source of disability is undoubtedly the lumbo-sacral joint. In the arthritic cases which make up the larger



CASE 21. Anterior posterior view showing contact between spinous processes of 4th and 5th lumbar vertebrae.

percentage in this series, nature has suggested the treatment, which is ankylosis of the 5th lumbar to the sacrum. The most satisfactory method of establishing ankylosis treatment is the fusion method of Hibbs, which was described in 1911. For the following reasons:

1. That the dissection incident to the exposure of the lumbo-sacral articulation affords excellent opportunity to examine the posterior portion of the joint. The lateral facets are easily exposed and one can gain valuable information at this time.

2. The ankylosis which is secured extends the whole width of laminae, even to the lateral facets, giving a very secure bony background for the support of the vertebrae.

3. The minimum risk attendant to the operation when properly performed; in a series of 101 fusion operations performed at the Memorial Hospital, there has been no mortality. Of the cases cited, the following have submitted to the operation:

CASE 1. In June, 1924. End result—Has been doing his regular work since three months following the operation.

CASE 2. Operation in December, 1925. End result—Patient doing regular work. No pain.

CASE 3. Operation December, 1925. Absolute relief from pain.

CASE 4. Operation April, 1926. Doing regular work. No pain.

CASE 5. Operation January, 1926. End result—Regular work.

CASE 6. July, 1926. Too early for end result.

CASE 7. March, 1926. End result—Relief from pain. Doing regular work.

CASE 8. Operation March, 1926. End result—Complete relief from pain. Doing regular work.

CASE 9. Ankylosis completed by immobilization in leather jacket in six months. Patient is now doing regular work.

CASE 10. Operation February, 1926. Patient has been doing regular work since eight weeks following operation.

CASE 11. Has not submitted to operation at present writing.

CASE 12. Operation January, 1925. Complete relief of pain. Doing regular work.

CASE 13. Operation December, 1925. Complete relief of pain. Doing regular work.

CASE 14. Still under treatment. In leather jacket; because of his age it did not seem advisable to operate upon this man.

CASE 15. Operation in January, 1926. Complete relief of pain.

CASE 16. Has not submitted to operation at present writing.

CASE 17. Operation June, 1926. End result—Still under treatment.

CASE 18. Has not submitted to operation.

CASE 19. Operation March, 1926. End result—Patient has resumed his work. No pain.

CASE 20. Operation June, 1926. Has resumed his regular occupation.

CASE 21. Operation May, 1926. Symptoms entirely relieved. Patient has resumed regular work.

CONCLUSION

From this series of cases it would seem that the lumbo-sacral arthritis is much more common cause of back pain than has previously been recognized.

The most effective method of dealing with this condition is the production of an ankylosis in this region.

Congenital anomalies of the 5th lumbar are not uncommon.

Sacralized lumbar vertebrae are frequently the cause of persistent backache and can be relieved only by ankylosis.

The approach necessary for fusion operation in this region gives an excellent opportunity to examine the bony structure and should be performed in selected cases in which the X-rays do not corroborate the physical findings.

The fusion operation is not accompanied by shock and is not a dangerous operation when done properly.

Lateral X-rays of the lumbo-sacral region are essential in arriving at a diagnosis of low back pain.

A SIMPLIFIED CLASSIFICATION OF CHRONIC ARTHRITIS*

BY CHARLES F. PAINTER, A.B., M.D.

It would be futile to attempt to present the many conflicting views which have been entertained at various times in respect to this "age-old" topic of arthritis. Suffice it to say that at present there is a good deal of unanimity of opinion and the many views represented by as many different classifications have been reduced to two or three: The controversy now seems to be concerned with the question of whether an infection is not really behind them all, whatever the classification. The *Journal of the American Medical Association* for the first of this month (September, 1926) has two articles on arthritis, the authors of one of which are of the opinion that the dual classification of Nichols and Richardson is the one which best disposes of, diagnostically, the majority of arthritic patients. The other article, curiously enough, deals with a new treatment by intravenous injection of a synthetic antiseptic composed of iodine and a benzoate which has been found in the laboratory to be destructive of cocci and certain bacteria. The writers of the article were using it with good results in cases that would have been classed by the authors of the other article as definitely non-toxic and therefore, at least theoretically, not suitable for such therapy.

It seems to me we have all along been too much inclined to approach the study of this subject from one aspect only, seldom taking a broad view point. The clinician has been impressed with a particular phenomenon such as faulty posture, peculiar anatomic make up, acidity of perspiration, low blood sugar, disturbance in the metabolism of creatin or creatinin and has decided that therein lay the clue not only to the etiology but the treatment as well. The pathologist, hoping to learn something of the nature of the disease from a study of the joint lesions has secured opportunity to perform autopsies at homes for incurables, hospitals for chronic diseases or Almshouses, where he had had access to terminal pathology only, and has suggested classifications based upon such changes. The result has been a variety of opinions and a most disconcerting nomenclature.

In 1909 Nichols and Richardson made a decidedly valuable contribution to the study of this subject when they presented to the profession their dual classification, for it simplified for the general practitioner the classification of the numerous types described in the literature. It comes short of being wholly satisfactory, however, in that it is based upon the use of two terms "degenerative" and "proliferative" which are descriptive of a type of gross pathologic lesions but leaves the question of underlying pathology entirely in abeyance. The degenerative type of Nichols and Richardson is characterized by osseous joint enlargements and is free from infection whereas their proliferative type is universally considered to be a toxic affair, the proliferative changes being due to attempts at repair about destructive or erosive lesions, caused by bacterial or toxic invasion. It would appear that we are now prepared to go a little further than they did, even though adopting the description of the lesions characteristic of their two types as essentially correct, designating their "proliferative" type as Toxic arthritis and their "degenerative" type as Metabolic. There will doubtless be found an occasional case where the application of all available methods of investigation may fail to result in a positive classification but I believe these occurrences will be very rare. It is my conviction that all types including tuberculosis, syphilis, traumatism, the specific arthropathies, juxta-articular inflammations, as for example osteomyelitis, neoplasms, and haemophilia should be ruled out wherever patients with obscure arthritic symptoms present themselves. Many a case complaining of joint symptoms will be discovered to be free from arthritis when subjected to a careful physical examination which would reveal a faulty anatomical situation no longer capable of defense from joint irritability by a waning muscular tone. This may be postural in a few cases or structural in a far larger number.

Nomenclature should seek to convey an etiologic or pathologic concept. Most of the terminology employed concerns itself with gross anatomic characteristics. An example of this is the use made of the term "arthritis deformans." Many of the cases to which this terminology is

*Read before the Clinical Congress of the Connecticut State Medical Society, held at New Haven, September 22, 1926.

applied are not inflammatory at all and *any* variety may be deforming. The term osteo-arthritis is equally carelessly chosen. Some observers mean one type and some another, when they use either term. Confounding of particular systemic disturbances or congenital aberrations which are merely resultant effects or concomitant occurrences, designating them as causative factors, has resulted in hindering the advance of our knowledge of these conditions. Interesting and even suggestive as some of these fancies have been they have not gotten us very far toward our goal for the reason that for the most part their adoption causes us to lose sight of the more significant clinical facts and their broad relationships.

We may therefore profitably center our attention upon the two main divisions into which arthritic subjects may be grouped by studies in etiology, pathology, clinical course and symptomatology, physical signs and behaviour under treatment, based upon these studies. First we may consider what is probably the larger group viz: that caused by infections. Scarcely any recognized member of the family of bacteria may be considered inert. The entire question of "focal infection" finds one of its most fruitful fields for speculation in the possible relationship of arthritic lesions to various local foci. In other clinical fields than the arthritic, bacteria which stand in a causal relation to the original infection, produce temperature and pulse reactions in the patient. These of course vary in degree with the severity of the infection or the resistance of the individual. Just this same phenomena is observed in joint infections. These reactions vary all the way from fulminating affairs in some of the more acute joint lesions to conditions where no change, or a very slight one, is noted in the behaviour of the temperature curve but where nevertheless there is a quite marked variation in the pulse rate, e.g., a normal temperature will be associated with an elevation of the pulse rate, even when the patient is quiet in bed, to from 100-110. Increase in the surface temperature may of course be observed in a traumatic synovitis or a purely metabolic disturbance and though it invariably accompanies a toxic arthritis it is not, of and by itself, pathognomonic. Swelling may be the result of effusion alone or of effusion plus capsular infiltration. As a rule the more acute the infection the more conspicuous is the element of effusion and the more chronic it is, the greater prominence attaches to infiltration. Discoloration may be that of passive congestion or active hyperaemia and here again the chronicity of the process plays a conspicuous rôle. Slow, chronic processes as a rule show passive congestion and clammy skin because infiltration interferes with capsular circulation, whereas acute ones are characterized by redness and greater surface temperature.

Deformity and muscle spasm go hand in hand, the latter being the cause of the former, in all cases at least in the beginning. Just as a cinder in the eye compels, through reflex spasm of the muscles controlling the lids, a closure of the eye, so the toxic invasion of the synovia usually causes a reflex contracture of the flexors of a joint. If the process is severe enough to attack and erode cartilage or bone the deformity may cease to be purely reflex and may become structural and uncorrectible except by osteotomy or Brisement forcè. Atrophy, the last to be considered of the purely objective signs of arthritis, is probably the result of disuse, for the most part, though there may be a reflex element in it also. It concerns itself with muscle, cartilage and even bone, and may be recognized by inspection, palpation, mensuration and the x-ray. Structural change in osseous tissue may be caused by the persistence of spasmodic contracture, preventing normal joint function and resulting in ligamentous capsular relaxations and subluxations at joints. Nutritive disturbances contribute their quota, in long standing cases, through compensating endarteritic alteration of the walls of arteries supplying blood to the part. Evidence of disturbance of the normal relation of pulse and temperature curves; presence of effusion without infiltration (in the absence of other so called acute phenomena), presence of active hyperaemia, early development of spasmodic contracture of muscles controlling a joint, and atrophy (particulary when developed rapidly) point to a toxic element in the causation of arthritis. Persons suffering from toxic lesions apart from any joint disturbance, are usually, to a greater or lesser extent, conscious of not feeling normal. They have lost their vim, failed in respect to appetite, faded as to color; in other words they are ill. To some extent this is generally true of sufferers from toxic arthritis. It is doubtless true that a multiplicity of joint involvements, even if not toxic in origin, may give rise to malaise, in proportion to the extent to which the involved joints interfere with function and consequently slow down metabolism. But this is a very different condition from that growing out of toxic absorption and interference with joint function. Pain, which is far more common in the toxic cases, produces its effect upon the patient's condition and morale both through the effort made to endure it and the loss of sleep and rest caused by it.

The absorption of toxines disturbs the pulse-temperature ratio and the presence of a toxic irritant in the joint capsule gives rise to local signs indicative of inflammation as already described. It does not matter whether the responsible organism is a haemolitic streptococcus, a

pneumococcus, a gonococcus, a colon or some other bacillus, the reactions are the same in general character and except as one may be able to get some light on the question, whence the organisms come, one cannot say from the gross clinical examination of the joint what one of the many possible infections is being dealt with, nor would it make much difference if we *did* know for there is little, to date, that is convincing in the evidence that vaccines or serums do any good in arthritic lesions. Careful and painstaking search may not be rewarded with any evidence of focal infection—the most probable and common of which are the gastro-intestinal tract, the tonsils and sinuses, the teeth, the genito-urinary tract, the ear, the gall bladder and the appendix, in about that order. In addition to these there may be occasional metastatic invasion from suppurating processes in the body.

X-ray studies in early toxic cases do not show much. Surgical exploration is, up to date, not often resorted to for diagnostic purposes but might with reasonable security be more often undertaken when other methods fail and the issue is of sufficient importance. In the later phases of toxic arthritic changes when cartilage becomes eroded or bone involved then the proliferative changes which characterize erosive lesions are revealed in the radiogram. Before that time only capsular thickening will be shown. In the metabolic type there are no capsular thickenings to cast shadows and the early cartilaginous proliferations are equally incapable of being shown on the x-ray film but when lime salts begin to be deposited then the radiogram reveals the characteristic spur formations so generally observed in this type of arthritis. The course of the symptoms and their method of onset together with their distribution are of some significance. The more acute the development of symptoms the more certain is it that the case belongs in the toxic category. Also, rapidity in succession of joint involvements speaks for a toxic origin. When it becomes apparent that onset and distribution indicate a toxic cause for an arthritis then it becomes necessary to search for possible sources for toxic absorption and study of the patient's past history and present status in respect to these matters must be carried out. Family history may now be gone into with more prospect of helpful hints, for, though of no great significance in the toxic types of arthritis, it is of very great value in the metabolic, because in the latter the frequency with which successive generations manifest these lesions, somewhere, is very great. In studying the significance of familial types of joint lesions it is important to be able to secure accurate information as to the variety and distribution of lesions in the patient's forbears. It is not enough to take as evidence to be employed in classifying a type before you, the statement that some ancestor "had rheumatism." The conditions which lay the groundwork for a metabolic arthritis are the factors of etiologic significance, i. e., conditions which retard the elimination of the waste products of metabolism. The evidence that such conditions are fundamental lies in the fact that careful chemical studies upon the metabolism of such patients has shown retention of calcium and sulphur in such individuals in amounts unmistakably high as compared with normal controls. Again the age of onset is of importance in classifying these patients. As might be anticipated, if a metabolic division is to be made, we should expect that its lesions would be manifested at a period when tissues and bodily functions were waning in their activities. It is rarely the case that one sees the metabolic variety of arthritis until after forty, usually from forty-five to sixty. On the other hand the toxic variety occurs at a period when infections are most common. The majority have their incidence at from thirty-five to forty. So far as physical signs are concerned the evidences in the joints are far different. The hypertrophic (metabolic) lesions are confined almost wholly to the marginal cartilage and show almost no capsular infiltration. Rarely is there an excess of joint fluid unless local spurs are so placed and sufficiently large to traumatize the adjoining synovial membrane, when there may be a localized capsular thickening. There is little atrophy and far less deformity than in the toxic type. Spasm of the protecting muscles of the joint does not exist. Motion may be restricted but this is usually the result of limiting osseous spurs. There are few or none of the usual cardinal signs of inflammation. The only exception to this is in the case of true gout, a variant from the hypertrophic type of metabolic joint lesion in which there are certain signs of an inflammatory nature, but these are sufficiently distinct and pathognomonic, making a mistake in diagnosis unlikely. Gross pathological material, obtained from operative exploration of joints, when done early in the course of either type furnish clear cut pictures, as distinctly characteristic as are the clinical and x-ray signs. The same may also be said of microscopic section. When it comes to treatment it depends upon what stage the process is in, when the toxic type is being considered. Protection or complete fixation of the involved joints is a prime essential in the treatment of the hypertrophic variety. Coupled with this must be measures to increase the eliminative activities of the kidneys, the skin and the intestines. Specific therapy, except for alkalines by mouth, has no rôle to play. Diet, except as directed to the reduction of weight, which is more frequently than not in excess of the normal, may be neglected. No focal infections have any direct bearing upon the problem. They

may require treatment in and for themselves but not because of any causal relation to the lesions.

In the toxic cases splinting and protection are demanded on general surgical principles at first but may be soon omitted or modified when spasm has gone and evidences of inflammation have subsided. Then physiotherapy is called for in some one or more of its various forms, particularly massage, passive motion and hydro- or thermo-therapy.

Diet is of far more importance then in the metabolic cases and should be of low protein content. A focus of infection, if confined to some one removable lesion may be removed, at times with spectacular results. Early diagnosis, however, is most essential if a good outcome is to be achieved.

I have left until the last a variety of multiple arthritis referred to, in this country at any rate, under the heading of "atrophic" arthritis. It seems to have a right to a special terminology though at the earlier stages of its career it can not be distinguished from the toxic variety. It is far more common in women; has more of a tendency to manifest symmetrical joint involvements, as though a segmental spinal cord lesion; is frequently associated with shock to the central nervous system as from fright or grief or very commonly apparently only the result of the wear and tear of life as from oft repeated and rapidly succeeding pregnancies along with the necessity for hard work, care and responsibility. There is seldom any suggested focal infection or toxic behaviour to the local lesions which develop strikingly atrophic changes in the articular cartilages, the skin, the nails and last of all in the bones themselves. The deformities are peculiarly disfiguring and disabling, apparently because of the extreme thinning and extensive erosion of cartilage. These consist of subluxations and lateral deviations especially in carpal, phalangeal, metacarpo-phalangeal and knee joints. Because of the not infrequent nerve-shock history in the etiology, the segmental distribution, the atrophic changes in other tissues as well as in those making up the joints and the absence of the usual indications of inflammatory change in the joints themselves it would seem as though this might be classed as Charcot's joints are, viz: as having been caused by an involvement of nutritional nerves as they make their way to the periphery through certain definite paths in the spinal cord. The degenerative changes in the joints of tabetic patients are doubtless due to luetic invasion of the cord. May not other infections operate in the same way showing a specificity for certain nerve paths responsible for the control of peripheral nutrition? Certainly these cases are unlike the toxic ones, which they most resemble in many ways. They best respond to a treatment which is based upon forcing their feeding, stimulating local nutrition about the joints through physiotherapeutic measures and limited or protected function of the joints involved by passive effort, where necessary, and active, where possible; also by measures directed toward the prevention of deformity at as early a period as such tendencies are recognized.

Another variant of this mediately toxic type of arthritis is that referred to as "Poker Back" or Strümpel-Marie's Spondylosis. Here is a lesion with a selective affinity for the inter-spinal ligaments. Rarely are other joints involved. It has the ear-marks of a toxic process operating however throughout a single structure or set of structures. Its final result is a practical ankylosis of the spine from occiput to sacrum. It is, in my experience at least, more frequently than not, associated with gastro-intestinal stasis a possible source of toxic absorption. It should be handled by the protection of jacket or brace to prevent deformity and lessen pain. Rarely the hips and shoulders are involved—very rarely any other articulations.

I feel sure that many of the perplexities attendant upon the classification of arthritic lesions and the institution of appropriate treatment will be materially lessened if care is exercised in history taking and physical examination, not forgetful of the possibility of a fecal infection or that the x-ray may throw light on pathology but not acting on the assumption that there *must* be a source of toxic absorption and that the *x-ray* may be regarded as the court of last resort. In other words this is an appeal for a painstaking study of each individual case from all clinical and pathological angles without prejudice in favor of any particular avenue of approach.

EXPERIMENTAL STUDIES ON OVARIAN FUNCTION

II. The Relation of Blood Supply to Ovarian Function in the Rat*

BY DONALD MACOMBER, M.D., F.A.C.S.

THE experiments reported in this paper are a continuation of a similar series carried out on the rabbit[1]. The rat was chosen for the practical reason that larger numbers can be used in account of the smaller size and greater ease in handling. Furthermore the rat has a definite and regularly recurring oestrous cycle, during which ovulation takes place, whereas in the rabbit ovulation only occurs after coitus. The only

*This work was aided by a grant of money from the Committee of Maternal Health.

[1] The previous paper in this series may be found in Volume 194, page 529.

possible objection to the use of the rat arises from the different anatomical relation of the ovaries. The ovary in the rat is enclosed in a capsule from which the Fallopian tube opens; whereas in the rabbit there is no such structure and procedures could be carried out upon the ovary in the latter animal which would be impossible in the rat without upsetting the whole mechanism.

As noted in the first article of this series, the original purpose had been to find out whether or not there was any relationship between ovarian function and the sympathetic nervous system. As in the previous experiment, so in these, it was impossible to see the sympathetic fibres with the unaided vision and so the same indirect method of procedure was adopted as before. One ovary was removed from all the animals alike, control as well as experimental animals. At the same time the ovarian artery, veins and nerve fibres were divided on the other side in one group of experimental animals and in another the ovarian artery only was ligated. Previous to operation the oestrous cycle was checked by vaginal smears[2] and after operation smears were examined again. It was noticeable that the oestrous cycle was considerably upset in the first group where ovarian vessels and nerves were divided as compared with the conditions as noted in the second group where the ovarian artery alone was ligated or in the controls where nothing was done to the remaining ovary. Eventually, however, except in two instances where the animals were old, smears showed a return to the normal rhythm of ovulation. There was apparently no disturbance to

APPENDIX

Summary of Ovarian Operations

First Series

A. Controls. One ovary removed.

1.	15♀	Normal cycles for 3 wks.	Op. 10/1/24—mated 10/6	4 y. b. 10/29/24
2.	52♀	Previously fertile 9 y. b. 11/28/24	12/2/24—mated 12/9	7 y. b. 12/31/24 8 y. b. 1/23/25
3.	21♀	Normal cycles for 3 wks.	Op. 10/7/24—mated 10/9	6 y. b. 11/1/24
4.	23♀	Normal cycles for 4 wks.	Op. 10/7/24—mated 10/11	4 y. b. 11/3/24
5.	28♀	Normal cycles for 1 wk.	Op. 10/21/24—sterile—PM.: Abscess with adhesions involving uterus	
6.	35♀	Normal cycles	Op. 12/2/24—mated 1/9/25	4 y. b. 2/3/25
7.	38♀	Normal cycles for 1 wk.	Op. 10/21/24—mated 10/31/24	2 y. b. 11/25/24

Summary of 7 controls in which one ovary was removed: All were promptly fertile except one (No. 28♀) which subsequently showed infection and should therefore be excluded. Average number of young, 35/7=5.0 per pregnancy.

First Series

B. One ovary removed—ovarian artery *only* divided on the other side.

1.	13♀	Normal cycles for 3 wks.	Op. 9/30/24—mated 10/15	6 y. b. 11/7/24
2.	16♀	Normal cycles for 3 wks.	Op. 10/1/24—mated 10/17	6 y. b. 11/10/24
3.	14♀	Normal cycles for 3 wks.	Op. 9/30/24—mated 10/6	6 y. b. 10/29/24
4.	8♀	Normal cycles for 2 wks.	Op. 9/24/24—mated 10/1	2 y. b. 10/23/24

Summary: In 4 females where the artery to the remaining ovary only was divided there was no effect whatever on fertility and the average litter was 20/4=5.0.

First Series

C. One ovary removed—and artery, vein and nerves on other side divided.

1.	29♀	Normal cycles for 1 wk.	Op. 10/21/24—sterile—PM.: Torsion of uterus and caseation of sutures	
2.	22♀	Normal cycles for 4 wks.	Op. 10/7/24—mated 10/21 PM.: Some caseation of sutures	1 y. b. 11/18/24
3.	34♀	Normal cycles for 1 wk.	Op. 10/21/24—mated 11/4	4 y. b. 11/29/24
4.	7♀	Normal cycles for 2 wks.	Op. 9/24/24—sterile—PM.: Normal	
5.	37♀	Normal cycles for 1 wk.	Op. 10/21/24—sterile—but PM. showed absorbing pregnancies	
6.	26♀	Normal cycles for 3 wks.	Op. 10/7/24—sterile—but too old and condition poor	
7.	27♀	Normal cycles for 3 wks.	Op. 10/7/24—sterile—but too old and condition poor	

Summary: Excluding 29♀ because of mechanical cause for sterility and 26♀ and 27♀ because of age and poor condition—there remain 4 animals in which the circulation, both arterial and venous, and nerve supply were severed. Of these, 1 was sterile and never showed evidence of having been pregnant; 1 was sterile because the pregnancies were absorbed, and 2 were partially fertile. The average litter size for the 2 fertile females was 2.5—for the 4, 1.25.

any appreciable degree in the ovulation of controls or of the animals where the ovarian artery alone was tied off.

After a sufficient interval for observation all animals were then mated during the proper stage of the oestrous cycle. The behavior during pregnancy and the number of young were recorded. The results of these matings are shown in the appendix. They are summarized and discussed in the following paragraphs.

In all, 7 females were operated upon and a single ovary removed. This was the control series. All of them proved to be promptly fertile except 1, which on postmortem examination showed an abscess with adhesions involving both uteri. This animal should therefore be excluded. There were in all 35 young born within one to two months, averaging 5.0 per pregnancy.

The second group, viz., those in which one ovary was removed and the ovarian artery only was divided on the other side, consisted of 4 animals. These animals gave birth to a total of 20 young within a month to six weeks. The average litter per pregnancy was just the same as with the controls, 5.0.

The last group was made up of 7 animals and in these, in addition to the removal of one ovary, the ovarian artery, veins and nerve fibres were divided. Two of these animals were rather old and the oestrus cycle never showed a return to normal. They should therefore be excluded for this reason, but the very fact that the function of ovulation was interrupted tends to demonstrate that the division of some, or all, of these structures has a profound effect upon function. Still another animal which proved to be sterile must be excluded because a postmortem examination showed a torsion of the uterus on the side with the remaining ovary, which was sufficient for mechanical reasons to account for the failure to reproduce. This leaves 4 animals. One of these was sterile without assignable cause, another failed to have young but when examined at autopsy showed absorbing pregnancies, and the other 2 were partially fertile, 1 giving birth to 4, and the other to 1 young one within four weeks. The average litter size for the 2 fertile females was therefore 2.5, but only 1.25 if the 4 animals are counted.

Any discussion of these results would be of little value at this time since taken in themselves they are too few to be of any real value. One can only say that they confirm results with the rabbit. They are quite inconclusive as to whether the decrease in fertility shown is due to alteration in the nerve function or in the circulation.

The answer to this question is given at least in part by the experiments which are reported in regard to the "Relation of Nerve Supply to Ovarian Function in the Rat"—paper No. III in this series.

BIBLIOGRAPHY

1 Macomber, Donald: Experimental Studies on Ovarian Function. 1. The Relation of Blood Supply to Ovarian Function in the Rabbit. Boston Med. and Surg. Jour., Vol. 194, p. 529, Mar. 25, 1926.
2 Long, Joseph A., and Evans, Herbert McLean: The Oestrous Cycle in the Rat and Its Associated Phenomena. Memoirs of the University of California, Vol. 6.

III. The Relation of Nerve Supply to Ovarian Function in the Rat*

BY DONALD MACOMBER, M.D., F.A.C.S.

In attempting to evaluate the experiments which had been carried out on the rabbit and the rat and which have been reported as I and II of this series† it became increasingly important to be able to isolate the nerve fibres going to the ovary and divide them without interfering with the circulation. As noted in one of the previous articles, it was impossible to do this with the naked eye. It was eventually found, however, that the nerve fibres could be seen through a binocular dissecting microscope. Microscopic sections of the ovary and of the structure which seemed to be the nerve confirmed this supposition. Figures 1 and 2 are microphotographs cut and stained to show the nerve fibre entering the ovary.

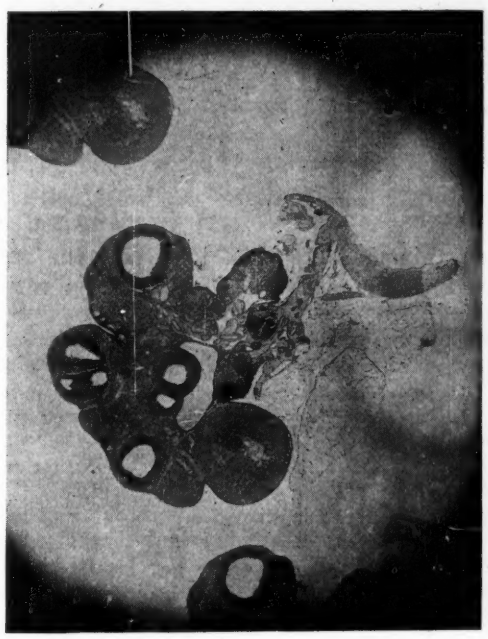


FIGURE 1. Section of normal rat ovary (×50) stained with Cochineal Orange G. This shows the nerve fibre entering the ovary.

Two series of experiments were carried out. In the first, the nerve to one ovary was divided

*This work was aided by a grant of money from the Committee of Maternal Health.
†Article I—see Boston Med. and Surg. Jour., Vol. 194, p. 529, Mar. 25, 1926.

and a section removed. In the second, sections of the nerves to both ovaries were removed.

FIGURE 2. Section of ovarian nerve fibre (×300) stained with Cochineal Orange G.

These animals were then bred and the results upon fertility observed. In the first series 6 animals were operated on and 4 had normal litters within a month. The other 2 became pregnant but for some reason or other the pregnancies were absorbed. In the second series excluding one animal which died before being mated, there were 7 females in which the nerves to both ovaries were divided. Six of these were promptly fertile, also within a month. The 7th was temporarily sterile but after a prolonged interval became fertile again. The litter size for all 13, counting the animal which showed delayed fertility and both animals with absorptions as sterile, was 5.3. In reality it was considerably higher than this figure. Table 1 gives the summary of all the experiments on ovarian function in the rat including those reported in Section II of this series (in this issue of the JOURNAL) and those reported in Section III (the present article).

These results prove conclusively that the nerve supply to the ovary is not necessary to the function of normal reproduction. They also show that the sterility produced by dividing ovarian artery, veins and nerves (see Experimental Studies on Ovarian Function II) was not due to any interference with the nerve supply. Experiments reported in this same previous article, in which the ovarian artery alone was divided without producing any notable amount of sterility, had showed that the interference with the arterial circulation alone could not be considered as responsible. By exclusion,

TABLE 1

First Series (see Studies on Ovarian Function II)

A	Litter size=5.0	(One ovary only removed—controls)	Sterility=14%
B	Litter size=5.0	(One ovary removed and artery on other side)	Sterility= 0%
C	Litter size=2.5	(One ovary removed and artery, vein and nerves on other side)	Sterility=50%

Second Series (see Studies on Ovarian Function III, i. e., those reported in this paper)

A and B	Litter size=6.9	(Nerve to one or both ovaries cut)	Partial sterility=22%
B alone	Litter size=7.7	(Nerve to both ovaries cut)	Temporary sterility=14%

APPENDIX

OPERATIONS PERFORMED UNDER BINOCULAR MICROSCOPE

A. Partial Controls:—Nerve to one ovary divided and a section removed.

1.	61♀	Operation 1/28/25	Mated 2/20	7 y. b. 3/17/25
2.	58♀	Operation 1/30/25	Mated 2/20	6 or 7 y. b. 3/17/25
3.	51♀	Operation 1/21/25	Mated 2/20	Pregnant but absorption
4.	62♀	Operation 1/28/25	Mated 2/20	Pregnant but absorption
5.	55♀	Operation 1/21/25	Mated 2/20	5 y. b. 3/24/25
6.	66♀	Operation 1/28/25	Mated 2/20	4 y. b. 3/17/25

B. Nerves to both ovaries divided and sections removed

1.	63♀	Operation 1/30/25	Mated 2/20	6 or 7 y. b. 3/17/25
2.	59♀	Operation 1/30/25	Mated 2/20	7 y. b. 3/19/25
3.	57♀	Operation 1/30/25	Mated 2/20	8 y. b. 3/17/25
4.	50♀	Operation 1/23/25	Mated 2/20	3 y. b. 3/17/25
5.	84♀	Operation 3/2/25	Mated 3/10	12 y. b. 4/3/25
6.	72♀	Operation 3/2/25	Mated 3/10	10 y. b. 4/14/25
7.	64♀	Operation 1/30/25	Mated 2/20	Temporarily sterile 1 y. 4/10—PM. 6/12: 5 normal pregnancies
8.	85♀	Operation 3/2/25	Died before mating 3/5/25	Excluded

Summary: Division of the nerves to the ovaries alone, i. e., where the circulation is unimpaired, does not affect fertility seriously. Where the nerves to both ovaries were cut 6 were promptly fertile and the average litter size was 7.7. In only one female was fertility temporarily reduced. Where the nerve to one ovary only was cut all became pregnant, but in 2 cases out of 6 there was absorption. For the remaining 4 the litter size was 5.6. For the entire 13 controls and experimental animals together and counting the 2 absorptions and the one delayed fertility as sterile the litter size was 5.3.

therefore, this experimental sterility which we have previously reported would seem to be due to some interference with the venous return from the ovary. Such a supposition is the more reasonable as it is well known in human surgery that interference with the venous circulation will often lead to the development of a cystic condition in the ovary. (For instance, when dealing with pus tubes or an extra-uterine pregnancy or some other condition which necessitates removal of a tube, the greatest care must be used to avoid interference with ovarian circulation. If this is not done there are many cases on record in which a subsequent operation becomes necessary to remove the ovary which has undergone cystic degeneration.) Nevertheless, reasonable as the proposition may appear, that interference with the venous return upsets ovarian function and may lead to permanent sterility, such a proposition must be rigidly submitted to the conditions of experimental research. It is the intention of the writer to do this and it is hoped that the results of further experimentation may be reported in this JOURNAL at some future date.

TRICHINOSIS A NEEDLESS DISEASE

THE recent report of a case of trichinosis in Connecticut serves as a reminder that this disease need not occur if all food be properly cooked. During the past 6 years, 56 cases of trichinosis have been reported in Connecticut.

Trichinosis results from eating uncooked pork, usually in the form of sausage. These parasites are killed by cooking. There is no danger of contracting the disease by eating well cooked pork. Between one and two per cent of American hogs are infested with this parasite and their flesh may thus convey the disease to persons who eat it uncooked.

The 56 cases of trichinosis reported during the past six years were distributed by months as follows:

January	22	May	1	September	2
February	5	June	1	October	5
March	6	July	1	November	0
April	5	August	5	December	3

From these figures it will be noted that while the disease may occur at any season of the year there is a tendency for it to be more prevalent during the winter and early spring months. In fact, more than two-thirds of the cases have occurred during the four months, January, February, March and April, and more than one-third of the cases occurred during the month of January alone. Of the 22 cases that occurred in January, 13 appeared to have occurred in one outbreak in 1921.

Trichinosis is more apt to result from eating freshly slaughtered pork than cold storage pork. Storage at near zero temperature tends to kill the parasites. It is said that keeping pork at not over 5 degrees F. for 20 days is sufficient to kill *Trichinella spiralis* larvae. A dependable preventive available to all is proper cooking of pork before it is eaten. It should be cooked till the meat turns white all through and does not appear red at any point. When so cooked the parasite causing trichinosis is killed.

This parasite may occur in large numbers in infested meat. As many as 1,200 have been counted in a piece of muscle weighing one gram which would make over a half million in a pound. It is estimated that the body of a person who has died from trichinosis may contain from 5,000,000 to 100,000,000 of these parasites. The severity of the disease depends upon the number of live parasites swallowed.

Trichinosis may be mistaken for typhoid fever, rheumatism, acute miliary tuberculosis and other diseases of common occurrence. The fact that more than one-third of the cases reported in Connecticut, or 21 out of a total of 56, were reported from Waterbury, may justify the suspicion that possibly the disease may have escaped notice elsewhere. Waterbury physicians are said to have had their attention drawn to the subject of trichinosis a few years ago so that they are on the lookout for cases of the disease.—*Bulletin of Connecticut State Department of Health.*

PAY FOR CHRISTMAS SEALS PROMPTLY

FIGURES have a good deal to recommend them.
They don't smile
And they don't frown.
They just stand here
And say one thing,
And they don't lie.
In America last year we spent per capita
$10.00 for candy
9.00 for education
3.50 for police protection
.75 for cosmetics
.50 for chewing gum
AND FOR HEALTH—29 cents
That is why the Tuberculosis and Public Health Associations
Of the Massachusetts Tuberculosis League
Hope that all the good people of the Commonwealth
Who received Christmas Seals
Will send in the money for them promptly
To help prevent tuberculosis in 1927
Especially by taking underweight children
To the twenty summer health camps.

Case Records of the Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 13011

EYE AND EAR INFIRMARY

A boy of fifteen entered the Infirmary August 10 complaining of a discharge from the left ear of three weeks' duration.

Three weeks before admission he had earache and moderate discharge from the left ear. Two weeks before admission he went to bed because of nausea and vomiting almost every time he ate. During the past two weeks he had had fever, frequent sweats, especially at night, several chills and occipital headache most of the time. He felt weak when he sat up, but not dizzy. There was no tinnitus. The hearing in the left ear was not so good as in the right. Three days before admission he had diplopia.

His family history was good. His father appeared normal. His mother looked like a neurasthenic.

His mother said he had had acute otitis media since infancy with remissions of a year or more. He had normal health and unusually keen mentality until he was thirteen. His family said he was "psychic," could locate lost articles with amazing accuracy. Then he began to have cyanosis on exertion, and once had to be "revived" by a physician. Two years before admission he had a period of amnesia in which he forgot his name and all his "schooling." This lasted a year. Then he suddenly snapped out of it, and had been fairly normal ever since, though there was some suspicion of his showing pyromaniacal tendencies.

Examination showed his heart and lungs in fit condition for ether. Examination of the fundi showed the disc edges blurred, the veins of both eyes overfilled and tortuous; a suggestion of beginning papillitis of both eyes, though it might be considered within normal limits. No hemorrhages were seen.

X-ray showed both mastoids of the sclerotic type.

A medical consultant could find no definite cause for the chills and fever outside the ear condition.

August 11 operation was done. The patient's condition was better the next day. On the 14th, however, he began to run a septic temperature, 99.5° to 105.1°. August 16 five cubic centimeters of 10 per cent. mercurochrome was given intravenously. A medical consultant found the examination negative. A blood culture taken on the 17th showed a profuse growth of streptococcus hemolyticus. The leucocyte count was 13,600, the polynuclears 85 per cent. August 18 a neurological consultant found no signs of intracranial disease. August 19 a medical consultant found petechiae. The heart was not enlarged, but was rapid, making interpretation of murmurs difficult. However, there was a soft mitral systolic murmur and a short late diastolic rumble at the apex. At the aortic area there was also a soft systolic murmur and a definite blowing diastolic murmur. The spinal fluid was bloody and showed 510 leucocytes, 92 per cent. polynuclears, 8 per cent. lymphocytes, and on culture showed a Gram-negative diplococcus (one intracellular seen) and Gram-negative streptococcus. After August 19 the temperature was never below 102°. Another medical consultant reported, "The prognosis could not be more grave." The nerve consultant reported "No treatment." August 20 there were loose watery stools and tympanites. Twenty cubic centimeters of 1 per cent. mercurochrome was given intravenously. Another blood culture August 21 showed Gram-positive streptococcus. The stool gave a very slightly positive guaiac. August 22 the patient died.

DISCUSSION

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

This story seems to be straight enough. We see at the outset no reason to look any further than the nervous system, the brain, in relation to that left ear. Of course that history of cyanosis is a little troublesome. But we take it tha the medical consultant examined his heart and lungs without finding any cause for it.

DR. OSCAR RICHARDSON: Do you know that, Dr. Cabot?

DR. CABOT: We do not, of course. The record says only that a medical consultant could find nothing wrong with him.

We have these various mental attacks, which do not seem to me to throw any light on the nature of the trouble,—that he has been "psychic," that he has had a period of amnesia, that he has been supposed to be "pyromaniacal." No one of them helps to tell us what is the matter with him now.

When anyone who has had an ear trouble begins to have fever, chills, sweats and headache we naturally suspect mastoid and its complications, often with meningitis or brain abscess. I suppose that it was for a local meningitis with or without actual abscess that the operation was done.

OPERATION

A manometer test was done as a preliminary to jugular ligation. The initial pressure was 290. Pressure on the left jugular caused no rise; pressure on the right 250—110—260. Pressure on both was inconclusive, as the joint of the needle leaked. The spinal fluid was negative.

On the basis of this test the left jugular vein was ligated. The vein did not fill from above, although the facial vein appeared to be patent.

A left simple mastoid operation was then done. The mastoid cavity was found to be broken down from tip to antrum. The sinus was uncovered—white, thick and bloodless. The dura was exposed and was normal. Granulations and a small amount of pus were curetted from the mastoid and the sinus exposed widely. It was packed above and incised. Organized material was removed as far down as the bul Free bleeding then via the pectoral vein. Packed below and upper end curetted nearly as far back as the torcular.

FURTHER DISCUSSION

This seems to be an operation for thrombosis of the cerebral sinus connected with sepsis of the middle ear spreading to the mastoid, but with no involvement of the brain found.

What about a Gram-negative streptococcus, Dr. Richardson?

DR. RICHARDSON: There is probably some fault in the technique of staining.

DIFFERENTIAL DIAGNOSIS

DR. CABOT: Streptococcus septicemia originating in the ear, which they did all they could for at the operation but could not check, seems clearly the main diagnosis. In the heart, in view of this later examination, we certainly expect to find trouble also. I wish we knew more about the pulse and the blood pressure, whether there was a Corrigan pulse and increased pulse pressure. I think it is rather better to assume, as nothing is said about it, that it was not there. We have to do without a good deal of evidence that we should have had if he had been in this hospital.

Mitral trouble on the whole seems the more likely, as an acute or subacute process, I should suppose on top of a chronic one. That is, I should suppose that they will find a mitral stenosis with an acute endocarditis on top. Whether there is any trouble in the aortic valve I should say, with the evidence before us, that we cannot predict.

I do not see any evidence that the lungs or the other organs are diseased. I do not see why the necropsy should show anything other than the evidences of septicemia of hemolytic streptococcus which we recovered from culture.

A PHYSICIAN: Does one ever get a meningitis from an endocarditis?

DR. CABOT: I think so, yes. And of course that brings up what I should have mentioned,—the spinal fluid, which gives proof, I should say, of meningitis, which apparently was not there at operation. At any rate they could not see it. But it developed afterwards. We cannot have such a spinal fluid as that without saying meningitis. How extensive it is is another question, but we are bound to make that prediction.

Infection, then, of the cerebral sinus from the ear in connection with an acute and subacute endocarditis, a streptococcus meningitis and general septicemia. The blood culture which did not develop until the day after death showed streptococcus.

A PHYSICIAN: Is there any reason to suppose the meningitis would be basilar rather than any other form?

DR. CABOT: I do not know any way in which that can be differentiated during life.

A PHYSICIAN: Would death have been more sudden in the case of basilar meningitis?

DR. CABOT: Not so far as I know.

POST-MORTEM LABORATORY FINDINGS

August 23 a blood culture transplant showed streptococcus.

A post-mortem differential count showed 49 per cent. polynuclears, 50 per cent. lymphocytes, 1 per cent. large mononuclears.

Stained smears from the clot removed from the sinus showed about an equal number of Gram-positive streptococci at either end.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Left otitis media (acute) with mastoiditis and lateral sinus thrombosis.
Septicemia.
Operation, left simple mastoid and jugular ligation.

DR. RICHARD C. CABOT'S DIAGNOSIS

Otitis media.
Thrombosis of the cerebral sinus.
Mastoiditis.
Acute and subacute endocarditis.
Streptococcus meningitis.
Septicemia.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesions*

Chronic and ulcerative endocarditis of the aortic valve.
Septicemia, streptococcus.
Otitis media, left.
Left mastoiditis.
Septic infarct of the spleen with associated general peritonitis.

2. *Secondary or terminal lesions*

Infarcts of the kidneys.
Acute pleuritis.
Soft hyperplastic spleen.
Hypertrophy and dilatation of the heart.
Chronic passive congestion, general.
Operation wounds.

DR. RICHARDSON: Let us take up the head first in this case. The operation wound in the left mastoid region was in good condition. On the left side of the neck there was a linear scar. The meninges and vessels of Willis were negative. That is, there was no meningitis and the sinuses were negative except that in the left lateral sinus there was a moderate amount of rather dry, adhering thrombotic material, and down the left internal jugular vein a mass of blood clot and some thrombotic material in the lower part of the vessel just above the ligation, which is, of course, what we should expect. The pineal and pituitary glands were negative. The right middle ear was negative. In the left middle ear there was old blood clot and some purulent material. The left mastoid region had been curetted out and wicked. The brain weighed 1290 grams, and on section was frankly negative.

The peritoneal cavity contained a moderate amount of thin opaque purulent fluid, frank thin pus, and the peritoneum generally and the serosa of the intestine were coated with a thin layer of fibrinopurulent material. The appendix was negative. The esophagus, stomach and intestines and the mesenteric and retroperitoneal glands were negative.

In each pleural cavity there was about 250 cubic centimeters of thin dirty brownish fluid and fibrin—pleuritis. The bronchial glands were negative. The lungs showed well marked passive congestion, and the pleura on each side was coated with fibrinous exudate in places.

The pericardium was negative. The heart weighed 315 grams,—for a boy of fifteen hypertrophy. There was a good myocardium, with considerable dilatation of the left cavities and on the right side slight dilatation. The valve circumferences were: mitral ten and a half centimeters, negative, aortic seven centimeters. Two cusps showed quite a little fibrous thickening and deformity, and the left posterior cusp on its ventricular aspect showed a mass of dirty brownish red vegetations. The mass was plaque-shaped, two centimeters across and three millimeters thick, and the central portion was necrotic, and presented a perforation four millimeters across. The auricular wall in the region of this mass of vegetations showed areas of purulent infiltration. The tricuspid and pulmonary valves were negative, the aorta and great branches and the circulatory apparatus generally negative.

The liver showed some congestion. The gall-bladder, bile-ducts, pancreas and duct of Wirsung were negative. The spleen weighed 535 grams, considerably enlarged. On the surface there was much exudate. In the region of the upper pole of the organ there was an infarct two and a half centimeters across which extended from the surface inward and showed purulent softening. This was the source of the peritonitis. We have had several cases where the peritonitis present was due to a purulent infarct in the spleen extending up to the surface and infecting the peritoneum. The tissue of the spleen generally was soft and purplish. The adrenals were negative. The kidneys showed some congestion, but were otherwise negative except that in each kidney there was a small infarct extending in from the surface. The cortex was six millimeters.

Culture from the heart blood showed a typical growth of streptococcus. Microscopic examination of the kidney was negative, and sections of the heart valve stained by Dr. Smith showed very beautiful sections in which the streptococci were visible.

DR. CABOT: Do you make any attempt to connect in either direction the ear process and the heart process?

DR. RICHARDSON: It is pretty difficult I think. There is no doubt but that anatomically he has a chronic endocarditis, and it is sufficiently chronic to be there, I should think, two years ago, and on top of that is the ulcerated subacute endocarditis with perforation and invasion of the auricular wall. I should be rather inclined to think that he had had middle ear trouble, then septicemia, and then the acute endocarditis on top of the chronic.

A PHYSICIAN: Does this mean that we shall have to consider middle ear as a source of infection for endocarditis?

DR. CABOT: I should not say that. When we think how tremendously common middle ear infections are and how few we have ever known to be associated with endocarditis, I think we would better not say they are such a source.

With this lumbar fluid we practically have to say he had a meningitis there.

DR. RICHARDSON: Yes, if that is certain.

DR. CABOT: Is there any reason that the meninges might not have got infected as his pleurae did? That came from the blood and lymphatics, and might have gone the same way to the cord.

DR. RICHARDSON: No.

DR. CABOT: Was there any more pus near the spleen than elsewhere?

DR. RICHARDSON: Yes. In all these cases everything else is eliminated, and there is the

absolute association with the infarct which is from the surface of the spleen inward, with the infarct itself purulent. So there is continuous purulent softening extending out from the spleen on to the peritoneum, and the peritoneum stuck to that place with exudate.

DR. EDWARD L. YOUNG, JR.: You don't mean that all these metastatic peritonitis cases, with pneumococcus, come from the spleen?

DR. RICHARDSON: No. It occurs at times in association with purulent infarcts in the spleen.

DR. YOUNG: I think it is interesting—I don't know whether you commented on it—that they treated it with mercurochrome and apparently the bugs liked it.

DR. RICHARDSON: I think they said something about blood in the rectum. Of course it is to be remembered that in giving mercurochrome mercurial poisoning may occur with marked lesions in the large intestine. We have had a few cases, and there have been several cases reported in New York.

DR. CABOT: One of the "Irish dividends."

CASE 13012

SHALL WE AMPUTATE?

DERMATOLOGICAL DEPARTMENT

Four years before admission the patient, a woman of sixty-eight, slipped and bumped her left shin. She insists that the skin was uninjured and that there was no black and blue spot. There was some local pain, however, for which she applied witch hazel followed by carbolized vaseline for several days. A week after the original trauma she noticed an ulceration the size of a pea. This increased in size in spite of medications prescribed by various doctors, as well as therapy in a hospital.

A letter from the patient's physician at the time of her admission to this hospital states: "I first saw her two years ago. The anterior surface of the leg from the upper third down and across the instep was ulcerated and in some places vesicular and pustular. The general appearance was that of an intense impetigo upon a chronic eczema. Culture from unbroken pustules gave a pure culture of streptococcus. My diagnosis was streptococcic infection on a gangrenous dermatitis caused by carbolic acid."

For the past three years she has not used her left foot but has resorted to crutches. There has been extreme stiffness of knee and ankle joints due to her prolonged stay in bed.

Three months ago she was admitted upon the surgical service with the entire lower leg involved in a crusting superficial infection. The upper part below the knee showed a well marked border of extension. The upper third showed a sloughing area with dirty granulations at the lower margin and a foul odor. The remainder of the leg was similarly although less seriously involved.

The blood showed slight anemia. A Wassermann test was negative.

X-ray examination showed osteoporosis of the bones of the leg.

Amputation was seriously considered at this time. A surgeon wrote, "In my opinion amputation will eventually be done; but if the Skin Department wish to treat I should be glad to have them do so." It was finally decided to transfer her to the Dermatological service.

Examination showed the skin in general abnormally dry with scaling, most marked over elbows. There was some yellow pigmentation with dried scales over the upper abdomen. There was a marble-sized warty growth on the chest medial to the right breast. The entire lower left leg from knee to ankle was involved in a dry scaling superficial infection. At the upper part, below the knee, was redness with a fairly well-marked border of extension. In the upper third of the leg anteriorly was a sloughing area about six centimeters in diameter. Posteriorly and laterally at this level was more advanced slough with dirty granulation at the lower margin. The remainder of the leg was definitely involved, but to a much less degree. The ankle was swollen. The slough had a foul odor.

DISCUSSION

BY CHARLES J. WHITE, M.D.

The question, I think, with all patients, is one of diagnosis. The surgeon in this case stated that this leg would eventually have to come off and might as well do so then as ever, but was willing to give us a chance to try what we could do. When the patient was admitted to the skin ward I think a little closer questioning was indulged in and we learned the true nature of the process.

Having made our tentative diagnosis we treated the patient accordingly and she was fairly rapidly healed so far as this ulcer was concerned, and eventually went out of the hospital with practically a whole leg. Since then the Orthopedic Department have straightened out her leg and she is practically a well woman so far as this process goes.

We found on questioning this patient more closely than had been done before that "for some years"—her statement is—she had been taking nightly doses of some medicine to make her sleep. The inference on our part was that she had been taking bromides for some years. These medicines were of course omitted and the leg proceeded to get well under proper applications.

The object of presenting this patient, when

Dr. Cabot suggested that I should present some patient, was two-fold: (1) that one should make a correct diagnosis in the case of a patient, and (2) that one should not operate until one has made the right diagnosis, because in the present instance this woman might easily have lost her leg if she had not been subjected to a "third degree" examination. Another point is the fact that the general medical man does not sufficiently often suspect a drug eruption. We men who are used to the skin make it a general rule, if we cannot make a diagnosis, to suspect drugs. For instance, an employee of this hospital was sent to the Skin Room this morning with a very puzzling eruption. It was only when we came to question him very closely that we found that he had been indulging in the much advertised remedy "Feenamint." This man had a phenolphthalein eruption. So when we cannot in the first place make a diagnosis, then we fuss over the patient a lot and we find that quite frequently a drug eruption is present.

I shall never forget the experience I had with a lady who came to me with a perfectly nice looking ulcer below the malleolus on one of her feet. She did not seem to have much in the way of varices, although we cannot tell, of course, if there are deep ones. But this ulcer would not get well. Finally I got desperate and tried Dakin's solution, something I had not used before. This lady called me at night and said I had to come to her at once. There had been a perfect explosion. The ulcer was puffed up, foul serum was coming out of it, and the whole thing had changed. I had to say, "I have not done this. You have not told me everything you know about this." Then she said to me, "I am going to tell you something I have never told even my husband, that is, that I am an epileptic. My attacks are mild, they come at night, and I have taken bromide every night." I had simply added fuel to flame in adding chlorin to bromin.

My point is, don't believe a patient even if she denies the truth. It is often necessary to squeeze hard to get it. I think this patient is a very striking illustration of the point I am trying to make,—that drug eruptions exist, that they are always mysterious, and that we have to work hard to get the true history.

DR. CABOT: Had she been taking a large dose of bromide?

DR. WHITE: I don't know. It may be a large dose over a short time or a small dose over a long time, or it may be a marked idiosyncrasy for the drug.

DR. CABOT: And bromide idiosyncrasies are very common?

DR. WHITE: Yes. Very few epileptics do not have bromide acne.

DR. YOUNG: Are there any other drugs that you suspect?

DR. WHITE: It depends on the character of the eruption. A bromide eruption may be vesicular, papillary, acneiform. There are vegetative ones, ulcerative ones, and it takes a good bit of knowledge to be aware of all the things that iodin and bromin can do to a person. They are even capable of producing death. Once we had a man here who took five iodipin tablets and then died. The makers claimed that all the bad part of the drug was eliminated and only the good left. When it came to necropsy we found that this man had no right kidney and only half a left kidney. The result was that he could not eliminate what is really poison, like many medicines if one takes too much of them.

DR. CABOT: Are there other drugs often taken for sleeping, like veronal and trional, that cause eruptions?

DR. WHITE: Yes. The most frequent offender is luminal. I remember once putting my foot in it very badly. I was asked to go to New Hampshire to see a patient who was in great distress. She had had some discomfort and her doctor had given luminal, and then she had more distress and more luminal was prescribed, a vicious circle.

Another point in regard to this present diagnosis was the question of syphilis, tuberculosis, possibly blastomycosis. Of course we had to eliminate all these possibilities before making our final diagnosis. As it was not any of these diseases we suspected drugs. Bromin is particularly characterized by vegetations, remember this. I should like to read this description by Prince Albert Morrow, which dates back to 1887. It seems to give about as good a description of this patient's dermatosis as anybody could give. The ulcers are described as "large, irregular, ulcerated patches raised from two to four millimeters above the surface. The elevated floor of the ulcer is firm, greyish red in color, with here and there an adherent crust. It secretes a sanious, fetid, puriform liquid, and bleeds upon being touched. It does not resemble ordinary granulation tissue; it is much firmer and composed of large masses. At points there are villous or papillomatous areas."

That is a good description of all these bromide eruptions and of this one in particular.

DR. CABOT: That is a very instructive case. I am glad you brought it before us.

DIAGNOSIS

Chronic ulcer of leg produced by potassium bromide and perpetuated by it.

CASE 13013

TO OPERATE OR TO "OCHSNERIZE"?

Surgical Department

An Italian-American schoolgirl twelve years old entered December 8 delirious and moribund. The history was obtained from her mother with some language difficulty.

December 5, four days before admission, the girl began to feel sick, refused to eat her supper and later vomited several times. She felt hot but had slight if any temperature. During the night she vomited two or three times. She had some pain in the right upper quadrant. In the morning a physician gave medicine which was promptly vomited. She now had a temperature of 103.5°. The vomiting continued. The pain in the right side became worse. The vomitus was bile stained. By December 7 the pain had become generalized throughout the abdomen, especially in the epigastrium. The mother thought this was due to the vomiting. An enema gave some results. The urine was scanty and deep colored, reddish, but was negative on the physician's examination. The urine had always been scanty and dark. She began to be irrational. The night of December 7 she was very restless. She had not had a bowel movement since the onset of the illness.

Her family history was good. Her past history was negative.

Examination showed a delirious girl thrashing about in bed in much pain. The skin was dusky. The lungs were normal. The apex impulse of the heart was in the fifth space. No measurements are recorded. The aortic second sound was equal to the pulmonic second sound. The abdomen was quite tense and tender throughout. There was no definite spasm. A questionable mass was felt on the right side. The extremities, pupils, reflexes and knee-jerks were normal. The ankle-jerks were absent.

There is no record of the urine or of the blood except 17,600 leucocytes.

An emergency portable X-ray of the chest gave plates which were unsatisfactory on account of motion. Both apices were hazy. The outline of the diaphragm was indistinct.

The temperature was 104.7° to 107.2°, the pulse 130 to 170, the respiration 23 to 31.

The patient was given a subpectoral the night of admission and another the following morning. Generalized abdominal tenderness persisted. There was some distension. That afternoon a genito-urinary consultant reported, "Chest normal. Heart normal except for very rapid rate; no evidence of meningitis. . . . There appears to be a great deal of tenderness and spasm in the right lower quadrant. I think the question of operation should be very carefully considered. But I believe that under the circumstances fluids and morphia are the best treatment. Get a blood culture." A blood culture showed no growth. That afternoon she died.

Discussion

BY EDWARD L. YOUNG, JR., M.D.

This temperature was presumably within twelve or fifteen hours from the onset.

"She has not had a bowel movement" I assume means other than the enema.

The X-ray tells us nothing.

Of course this history is not so clean cut as we should like to get, and it might be the story of two or three different things. The thing we think of first in a young person with a belly-ache is the appendix always, and this whole story is entirely consistent with a fulminating appendix rapidly becoming peritonitis.

When she comes to the hospital, as we have the picture given us on paper, it is with a general peritonitis. A temperature of 103.5° within twelve or fifteen hours after the onset of an appendicitis is unusually high. We always consider here that any temperature of 103° rules out an uncomplicated appendix, that is, it is either ruptured, giving a peritonitis, or it is not an appendix, and although every rule has its exceptions, this is a very good working rule to put us on guard against the unusual.

Of course this onset could go with trouble above the diaphragm. A pneumonia will give this type of onset and this temperature, but it ought not to give the picture that is seen here when she comes in, assuming this chest examination to be accurate, because four days after the onset a pneumonia ought to show itself to a good examination in the vast majority of cases. I recall only one case that I have seen here in the Emergency Ward where the question between an acute abdomen and pneumonia came up, where pneumonia was actually present and not clear to good examination four days after the onset. I think Dr. Cabot will back me up in saying that within four days it ought to show itself.

We have come, then, to a diagnosis of general peritonitis. At twelve that is probably due to appendicitis, even though the pain seemed to be in the upper part of the right side. That does not rule it out. Mesenteric glands with secondary infection which have ruptured are a very poor second. Other conditions, such as gall-bladder disease, ruptured viscus, which might have to be considered in an adult, are very unusual in a child of twelve. Whatever the cause of it is, the question of treatment is the question of treatment of peritonitis. There comes a time in every peritonitis when the original cause of that peritonitis ceases of itself to be of sufficient

importance to be considered individually in the treatment. The treatment is that of the peritonitis as a whole.

Now surgery does not help peritonitis when it gets beyond a certain point. I think it was nearly twenty years ago that Ochsner of Chicago advocated the treatment which goes by his name today, that is, the use of absolute rest to give the patient a chance to localize the infection. By absolute rest was meant nothing by mouth, food to be supplied subpectorally and by rectum, morphia enough to keep the patient absolutely quiet and peristalsis in the abdomen absent, Fowler's position, because the absorption of poison from the abdominal cavity gets less as the fluid is nearer the pelvis, and cold to the surface of the abdomen. Of course, particularly at this age, it is impossible always to see from the symptoms just how far the peritonitis has gone and whether it has gone beyond the point where surgery of the original focus will help. So that in actual practice Ochsner's treatment often comes down to a justification of omitting surgery where it seems certain that the case is moribund, as stated here. It is not fair to use that as a sweeping statement, because it undoubtedly does help certain cases where operation would undoubtedly push them over the line. Rest does give them a chance so that successful surgery can be done later. I do not think those cases are very common however.

In this case that type of treatment was apparently decided upon. On the basis of the mass which they felt or thought they felt in the right lower quadrant the best diagnosis seems to me to be peritonitis from an appendix. Whether Dr. Mallory can tell us anything more or not I will leave to him.

DR. MALLORY: Would you consider pneumococcus peritonitis? That was considered.

DR. YOUNG: I have never seen any without some evidence that could be obtained of a previous throat or upper respiratory infection. I saw some in that epidemic of streptococcus throat ten years or more ago where there was no obvious evidence before the peritonitis started—I saw one to be exact—and yet inasmuch as it came during that epidemic it was assumed that there was a throat as a start. Other than that I do not know that I have ever seen a metastatic peritonitis without the throat or upper respiratory infection being obvious.

Just on the basis of that indefinite mass and on the theory of chances I will say appendicitis.

DR. MALLORY: One other thing I should like to ask about. The suggestion was made that in general after a perforated appendix the temperature was apt to drop rather than to rise to such a high point.

DR. YOUNG: I think that is often true. But that initial temperature is extremely unusual for anything short of peritonitis. That makes me suspicious at once. I think here the house officers all have that same feeling, that if the temperature is above 102° they get suspicious, and if it is 103° the burden of proof is on the man who says it is an appendix. That is an unusually high temperature. I don't know what else I have to say, though, even at that.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

General peritonitis.

DR. EDWARD L. YOUNG'S DIAGNOSIS

General peritonitis, probably due to appendicitis.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

Acute appendicitis.

2. *Secondary or terminal lesions*

Phlegmon of the retroperitoneal tissues, abdominal wall and anterior vesical wall.
Perforation of the ileum.
General peritonitis (slight).

3. *Historical landmarks*

Precocious development of secondary sexual characteristics.

DR. MALLORY: There is one thing about the patient not brought out in the record, which is of some interest, although we found no explanation for it. The age is stated as twelve years, and I think that is probably correct, yet she must have weighed in the neighborhood of 140 pounds and the body looked like that of a girl of sixteen or seventeen, with marked development of the secondary sexual characteristics.

We were not allowed to open the head. I do not know if we should have found anything in the pituitary.

The case was primarily one of appendicitis. On incision through the abdominal wall a thin layer of pus was found between the peritoneum and the transversus abdominalis, a diffuse phlegmon of the abdominal wall. The omentum completely covered the viscera and was adherent. It was deeply injected and in places showed patches of fibrinopurulent exudate. The intestines were found to be only slightly injected, and there were very minute patches of fibrin holding the coils together, but the degree of general peritonitis was very slight indeed.

The appendix was lying retrocecally almost up to the lower pole of the right kidney. It was nearly eight centimeters in length, the first six centimeters having an average diameter of one centimeter. In the last two the tip bulged to a diameter of one and seven-tenths centimeters.

This tip was deep reddish black, friable, practically gangrenous. Surrounding the appendix was a large abscess cavity, pretty well walled off from the general peritoneal cavity, and the pus from this extended retroperitoneally up into the perirenal fat and down into the pelvis, where there was a layer about two millimeters thick completely surrounding the anterior wall of the bladder. But there was nothing posteriorly, and rectal examination I believe had been negative. There was so far as we could make out no definite perforation of the appendix itself. However, there was a perforation in the ileum at a point four centimeters from the ileocecal valve, where a patch of fibrin had rather loosely bound this to the abdominal wall and a round perforation had taken place in the center of that. That of course was secondary to the extension of the original lesion.

DR. YOUNG: Was that, rather than the appendix, then, the cause of the general peritonitis, what there was of it?

DR. MALLORY: I imagine so.

In connection with her very unusual development it was interesting that the thymus was large. It was four by four centimeters and rather more than half a centimeter in thickness. Of course she was only twelve years old, when she normally would have a persistence of thymus tissue, but at least in proportion to the body size that seemed like a great deal.

There was also a slight but very definite degree of arteriosclerosis, at the age of twelve. One flap of the mitral valve showed a bright yellow, slightly raised line about one centimeter in length and one millimeter in width, but a quite definitely atheromatous condition, and in the aorta there were several more similar areas just above the aortic valves, each very slight but unquestionably arteriosclerotic in character.

The uterus was infantile in size and position, but the endometrium close up to the fundus was of normal adult appearance, somewhat hyperplastic. The ovaries were of normal adult size, with rather thickened surfaces, and both ovaries contained small cysts averaging two millimeters in diameter containing slightly reddish fluid, typical of retention cysts in adult ovaries.

DR. YOUNG: I think she might have had a better chance if that abscess had been drained than by letting her alone. We see many acute abdomens, and this question of Ochsner treatment comes up every little while for discussion. I think I am apt to be on the slightly radical side. This is one case in which although I do not think she had much chance anyway we put it, the only one would have been the release of what would have been a very large amount of sepsis, which could have been done under local anesthesia without having to spread anything in the cavity.

DR. CABOT: Was that pus in the front of the bladder in connection with the Fowler's position?

DR. YOUNG: I think not. It will go into the kidney pouch and down on this plane and be about the bladder frequently.

DEATH RATES OF MOTHERS FROM CHILDBIRTH: 1925

THE Department of Commerce announces that the changes in the death rates of mothers from childbirth, or puerperal causes, were very slight in 1925 as compared with 1924.

For the 32 states for which figures are available for 1925 and 1924 the rate from puerperal septicemia was 2.4 per 1,000 live births for both years and the rate from other puerperal causes was 4 for both years. Of these 32 states 16 showed higher rates from all puerperal causes in 1925 than in 1924.

For the 26 states and the District of Columbia, which constituted the "Birth Registration Area of 1921," the rate from all puerperal causes decreased from 6.7 in 1921 to 6.4 in 1925 per 1,000 live births, and the rate from puerperal septicemia from 2.7 to 2.4 per 1,000 live births.

Florida had the highest death rate in 1925 from all puerperal causes (12.1 per 1,000 live births), and Connecticut the lowest (4.9).

Separate rates for white and colored are shown for only six states: Florida, Kentucky, Maryland, Mississippi, North Carolina, and Virginia. The highest rates in 1925 for both white and colored were for Florida (10.2 and 16.3 per 1,000 live births, respectively), and the lowest were for Maryland (5.1 and 8.9 respectively).

PRINCIPAL CAUSES OF DEATH: 1925

THE Department of Commerce announces that 1,219,019 deaths occurred in 1925 within the death registration area of continental United States, representing a death rate of 11.8 per 1,000 population—the same as the rate for 1924.

This death registration area in 1925 comprised 40 states, the District of Columbia, and 24 cities in nonregistration states, with a total estimated population on July 1 of 103,108,000, or 89.4 per cent of the estimated population of the United States.

The principal decreases in death rates in 1925 were from measles, from 9 to 2 per 100,000 population, pneumonia, all forms, from 98 to 94, and tuberculosis, all forms from 90 to 87.

Increases in rates in 1925 were for influenza, from 20 to 30 per 100,000 population, diseases of the heart, from 178 to 186, nephritis, from 90 to 96, and diarrhea and enteritis, under 2 years, from 28 to 32.

THE BOSTON
Medical and Surgical Journal

Established in 1828

Published by The Massachusetts Medical Society under the jurisdiction of the following-named committee:

For three years HOMER GAGE, M.D., *Chairman*
EDWARD C. STREETER, M.D.
EDWARD W. TAYLOR, M.D.

For two years WILLIAM H. ROBEY, JR., M.D.
ROGER I. LEE, M.D.
ROBERT B. OSGOOD, M.D.

For one year JOHN W. BARTOL, M.D.
HORACE D. ARNOLD, M.D.
CHANNING FROTHINGHAM, M.D.

EDITORIAL STAFF

DAVID L. EDSALL, M.D.
REID HUNT, M.D.
FRANCIS W. PEABODY, M.D.
JOHN P. SUTHERLAND, M.D.
GEORGE R. MINOT, M.D.
FRANK H. LAHEY, M.D.
STEPHEN RUSHMORE, M.D.
HANS ZINSSER, M.D.
BENJAMIN WHITE, PH.D.
HENRY R. VIETS, M.D.
ROBERT N. NYE, M.D.
SHIELDS WARREN, M.D.

WALTER P. BOWERS, M.D., *Managing Editor*

ASSOCIATE EDITORS

GEORGE G. SMITH, M.D.
WILLIAM B. BREED, M.D.
JOSEPH GARLAND, M.D.

SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, $7.56 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 126 Massachusetts Ave.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The Boston Medical and Surgical Journal. 126 Massachusetts Ave., Boston, Mass.

INTERFERENCE BY THE PROHIBITION ADMINISTRATOR WITH THE RIGHT OF PHYSICIANS TO PURCHASE ALCOHOL

ACCORDING to information received recently, the Prohibition Administrator of the District covering the New England States (with the exception of Connecticut) proposes to restrict the privileges now existing under the Volstead Act and amendments thereto extended to physicians with respect to the amount of alcohol which may be purchased, basing the restriction on the amount procured by a doctor in a preceding year. For example, in one case a doctor who is engaged to some extent in surgical practice who did not require the whole amount of alcohol permitted under the law last year is to be allowed to purchase only the amount used in 1926. The Administrator seems to have assumed that a surgeon's practice is not a growing business. Most young men expect to enlarge their professional activities and it is perfectly well known that alcohol is a most valuable agent in surgical and laboratory work.

This appears to be a most arbitrary and unjustifiable curtailment of the proper needs of a certain doctor. No suggestion of improper use of alcohol is made in the notice sent to this doctor, only that since he used a certain amount last year that should be sufficient for the coming year.

We do not question the intentions of the Administrator, but we do question his interpretation of his functions. All who know this gentleman respect him for his sterling personal qualities, but we believe that he has been led to arrive at illogical estimates of the proper amount of alcohol for which some doctors may find legitimate use. A surgeon whose practice is almost entirely in hospitals might not need to purchase much alcohol for the cleansing of his hands, for it would be furnished by the hospital. If on the other hand he operated outside of hospitals, he might find need for much more alcohol. If honorable physicians are to be hampered and annoyed by unreasonable regulations, we predict that there will be a time when the majority of the medical practitioners of this country will use all possible influence to bring about a decent regard for their needs in legitimate practice.

It would be unbecoming to exhibit any great concern about the fundamental purpose of the Volstead Act with respect to the use of alcoholic liquors as beverages, but when our actual needs are subjected to unjust regulation, the profession should rise as a body and strike hard for its rights.

THE HAZARDS OF THE HOME

ABOUT seventeen thousand deaths and several million injuries occur from accidents in the American home each year. Safety First campaigns have been enthusiastically prosecuted in our factories and shops and the hazards of railroad and street travel have been and still are being materially reduced. As time goes on more and more potential causes of serious accidents are being introduced into our homes. Forty years ago a fall, a cut, or burns from wood stove or lamp were practically the only things the housewife needed to fear. Now gas fixtures, hot-water heaters, electric washing machines are among the many traps for the unwary.

Most of these fatal accidents occur among adult women, though more than a third are among children under fifteen years of age. The largest items are burns, falls, and poisonings by gas. Burns are of all types, though starting the fire with kerosene or gasolene or flare-backs from gas stoves are among the commonest. Gas poisoning provides many of the deaths, not infrequently through faulty temporary connections to jet or fixture. It is a strange thing that the same man who is keenly alive to the need of safety appliances in his place of work will tolerate dark and often broken or cluttered cellar

stairs in his own home, and that a large proportion of our coal burning population prefers to save a few minutes in the morning by lighting the kitchen fire with the help of gasolene or kerosene with the attendant risk of serious or even fatal burns. The physician who is called to see the case of gas or carbon monoxide poisoning may be well aware of the danger, but will tolerate worn-out rubber or metal connections on gas appliances in his own house. We have waited too long for the toll of deaths and accidents in the home to reduce itself. It is time that we show the same interest in the welfare of the housewife that we do in the employee protected by the Workmen's Compensation Act. With all of our multifarious agencies for the protection of human life and the promotion of human welfare, it would seem as though some one of them might find a fertile field in the protection of those patient but neglected workers in our homes.

THE TRAINING OF NURSES

THE Yale School for Nurses is a step in breaking the domination of the education of nurses by the hospitals. The tendency of the school is toward the abolition of the apprentice system, apparently in the belief that the sick will receive better care from those who have read books and received lectures on the duties of a nurse rather than from actual performance of them. From time to time there have been futile protests, some earnest and some half-hearted, against the growing tendency to educate the nurse too highly for her work, but none of them have met with success. Our American passion for organization leads us to commit ourselves to the guidance of a more or less haphazardly chosen few though their policies may affect us all. The officers of an organization must justify their existence whether they be those of a labor union or those of the National Education Association. It is natural and proper for leaders to glorify the work of their particular group. It impresses members and outsiders alike to accentuate the difficulties of gaining membership. Both these methods are entirely worthy, but at times their results may be more far reaching than even their proponents can see.

There is a sad deal of truth in the old joke about the New England housewife who complained to her physician, "But I can't have a nurse, Doctor, I am too sick to look after her." By all means we should appreciate the work of the nurse and honor those women who devote their lives to the care of the sick, but it is time to realize that, if the present trends in nursing education are not changed, the nurse will regard personal service for her patient as beneath her dignity and the high cost of the elaborate training insisted on will restrict nursing service to institutions and to the homes of the wealthy.

The nursing profession as a whole has steadily and rightly fought for high educational standards and has frowned on the establishment and recognition of training schools with low qualifications, but more and more the graduates of the present schools insist on institutional work and attempt to avoid the equally necessary individual care of patients. The growing vogue of the so-called nursing attendant is a significant indication of the reaction of the laity to the overtraining of the nurse. It may be that the solution of the problem will lie in a modification of some such arrangement as that of the Massachusetts General Hospital and of the Children's Hospital in co-operation with Simmons College, where a five-year course is given for those desiring public health nursing or the more specialized types of institutional work. It would seem that by concentrating on practical nursing in the three-year course and on the theoretical aspects in the five-year course, the latter to be given perhaps by a small number of particularly well-qualified institutions, we could provide nurses to fill the need both for the home and for the hospital or welfare agency. In any event it would be well for the leaders of the nursing profession to consider whether the desire for thorough training of the pupil nurse does not carry them too far.

GAS BACILLUS INFECTION FROM WOOLEN CLOTHING

THE interesting work of Gage,* recently reported, may go far towards explaining the occasional case of gas bacillus infection in which the mode of infection has remained a mystery to the surgeon.

In three of the cases reported by Gage, wool was the responsible agent in transferring the infection, in one instance from the felt pads from shot-gun shells; and in the others from woolen clothing. Wadding from four shells not yet discharged was examined and the presence of b. Welchii was demonstrated.

In one of the gun shot cases reported, Gage states that, "The patient had on at the time of the accident a new suit. It was decided to investigate this, and cloth was taken from around the shot holes, and cultures of the cloth were positive for b. Welchii.

"Four other samples of clothing were studied, three from patients, and one from the author, with again uniformly positive results. In addition five samples of wool cloth were obtained from a tailor, and cultured anaerobically. B. Welchii was found in each piece of cloth."

*Gage, I. M., M.D.: "Gas Gangrene." American Journal of Surgery, Vol. 1, No. 4, pp. 177-84.

He concludes: "This seems to suggest that possibly the source of certain hitherto unexplained infections from hypodermics and hypodermoclysis may be due to contact with woolen blankets, in which the patients were wrapped."

Gage's important study gives much food for thought, and should certainly teach the lesson of keeping woolen materials from direct contact with recent needle punctures.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

WHITTEMORE, WYMAN, S.B.; M.D. Harvard Medical School 1905; F.A.C.S., Instructor in Surgery Harvard Medical School, Assistant Visiting Surgeon Massachusetts General Hospital, Fellow American Surgical Association, American Association for Thoracic Surgery and Member of the New England Surgical Society. His subject is "Thoracoplasty in Pulmonary Tuberculosis." Page 1. Address: 199 Beacon Street, Boston.

AYERS, CHARLES E., M.D. Tufts College Medical School 1912; F.A.C.S., Orthopaedic Surgeon Memorial Hospital, Worcester, Massachusetts, Consulting Orthopaedic Surgeon Milford Hospital, Milford, Massachusetts. His subject is: "Lumbo-Sacral Backache." Page 9. Address: 36 Pleasant Street, Worcester, Mass.

PAINTER, CHARLES F., A.M.; M.D. Harvard Medical School 1895; Professor of The History of Medicine, Tufts College Medical School, Associate in Orthopaedic Surgery Graduate School of Harvard University. His subject is: "A Simplified Classification of Chronic Arthritis." Page 16. Address: 520 Commonwealth Avenue, Boston.

MACOMBER, DONALD, A.B.; M.D. Harvard Medical School 1909; F.A.C.S., Research Fellow in Obstetrics Harvard Medical School. His subject is: "Experimental Studies on Ovarian Function in the Rat." Page 19. Address: 321 Dartmouth Street, Boston.

MISCELLANY

GOOD MILK

FOLLOWING recommendations of the United States Public Health Service, the Standard Milk Ordinance has been adopted by thirteen states and one hundred and seventeen cities. The states are in the order of adoption: Alabama, North Carolina, Texas, Virginia, Tennessee, South Carolina, Missouri, Kentucky, Arkansas, Louisiana, Utah, Mississippi and West Virginia.

Under this plan it is hoped that there will be a unification of milk control in the United States. The Public Health Service will co-operate with the States in furnishing inspections and advice.

The importance of the subject may be found in the hygiene of milk production and distribution and also in the economic factors underlying the industry.

Practically everybody knows that milk is either a blessing or a curse. Good, pure milk is almost a necessity in the scheme of life, and contaminated milk is a great menace. In 1925 there were more than forty outbreaks of milk-borne diseases which were recognized and of course other dangers existed which could not be recorded.

The Public Health Service is studying pasteurization of milk which at the present time is in a somewhat chaotic state. Although some methods may destroy harmful bacteria the creaming quality of milk is faulty in some otherwise effective processes. And certain other qualities may be modified if the pasteurization is over done. The general adoption of the milk ordinance will be advantageous because the average consumer and the producer will get better returns.

KEEPING THE ATMOSPHERE CLEAN

WHEN an industrial community realizes that keeping the air clean is a project of similar magnitude to keeping streets clean, providing clean water, removing city waste, or guarding the moral atmosphere, then there may be hope of success in smoke abatement, states O. P. Hood, chief mechanical engineer, Bureau of Mines. "We usually think of the project in too small terms," continues Mr. Hood. "It is thought of as is the dog catcher or the boiler inspector—a matter of a man or two, a job or two, and a small appropriation of variable and uncertain amount, to be abolished in a fit of economy and reëstablished under pressure of a vigorous minority.

"Even so, it is surprising how much is obtained for the effort; but the community is rarely satisfied, for the job is bigger than it was conceived to be. Continuous, never-ceasing effort is required to clean up a smoky city. A few months of relaxation and some years of effort are canceled.

"It is useless to look for a spectacular cure. Success comes only after long-continued, highly skillful effort. When a new plant goes in and it proves to be a smoker, remedying the condition is difficult. The community will probably have to stand smoke for a long time while the owner spends money temporizing with weak expedients, finally arriving at the conclusion that 'it can not be done.' The remedy is to provide

such engineering oversight of new installations as to insure a nonsmoking plant to begin with. This can be done.

"There is a great waste of ineffective effort in smoke-abatement agitation that gets nowhere because of a lack of vision as to the kind of job it is and an unwillingness to pay the price. Engineers believe that it can be done, and at a price not out of proportion to its worth."—*Department of Commerce, Washington.*

CITATION FOR THE AWARD OF THE SOFIE A. NORDOFF-JUNG CANCER PRIZE

THE Sofie A. Nordoff-Jung Prize for the best contribution in Cancer Research during the past year has been awarded to Dr. Otto Warburg, Director of the Department of Biology of the Kaiser Wilhelm Institute, Berlin-Dahlem. The award was made on the unanimous decision of the commission.

The novel methods of investigation, developed by Professor Warburg, have opened reliable channels for tests on the metabolism of surviving tissues under varying conditions. With a singular predetermination he has made available an abundance of valuable material through comparative experimentations on the processes of disintegration and oxidation of normal tissues, and neoplasms. His biochemical attack on the cancer problem presages the most promising results.

Professors Borst, Doederlein, von Romberg, and Sauberbruch, all of the University of Munich, form the awarding commission.

RECENT DEATHS

BRUNICK—DR. PATRICK VINCENT BRUNICK, a practitioner of South Boston, where he was born 39 years ago, died at his home December 28, 1926, of sepsis from an operating wound.

He began his education in the Bigelow School. After graduating from South Boston High School he attended Tufts College Medical School and graduated in 1914. He served four years under the late Dr. John Bottomley at the Carney Hospital and then opened his own office.

Besides his widow, he leaves three sons and three daughters.

Dr. Brunick was a member of the American Medical Association, the Massachusetts Medical Society and the South Boston Medical Association. He was a member of the Boston Lodge of Elks; the South Boston Council, Knights of Columbus; the Massachusetts Catholic Order of Foresters, Edward Everett Court; and the board of trustees of the Columbus Associates, a real estate organization in South Boston.

SIMMONS—DR. WILLIAM EDMUND SIMMONS, formerly physician to the Hollis Street Theater, with an office in Hollis Street, Boston, committed suicide at his home in Brookline by cutting the arteries in his wrists with a safety razor blade, December 29, 1926. He had been a sufferer with arthritis and is thought to have had melancholia recently. Dr. Simmons was a graduate of Baltimore Medical College, in 1886. He is survived by his widow and by a stepson. During most of his career he was especially well known as physician to many of the country's great theatrical stars. As physician to the Hollis Theater he attended Henry Irving and John Drew when both were at the height of their careers.

CORRESPONDENCE

EXPERT TESTIMONY IN MENTAL CASES

December 30, 1926.

Editor, Boston Medical and Surgical Journal:

Through the JOURNAL I desire to present the following for discussion and criticism. "District Attorney Crowe of Chicago demands verdict of murder of first degree in the Craokin case" is the title of an editorial in *Sunday Standard* of New Bedford and expert testimony is in the limelight.

As to mental experts so called, why is it that the definition of what is a normal mind is never defined understandably, at least to laymen? We have variations from the normal mind which are called psychoses, hysteria, psychopathic personality, manic depressive, etc., of a functional type with unknown pathological findings in most instances. On the other hand we have the organic (tissue destroyed) types such as imbeciles, idiots, dementia, paralytical (syphilis), those due to drugs, opiates, veronal, alcohol confusions and deliriums as well as those with diseases like meningitis, pneumonia, scarlet fever, septicemia, apoplexies, etc. All the above must enter into the expert opinion as to the abnormal mind to determine the mental responsibility for the *crime*, as well as mental age, history, etc.

Now it would seem to me that the mistake we make applies even to the doctors, viz.: Separating the human mind from the human body; which should not be done. One will not function properly without the other.

Therefore this suggestion is made: That in all capital cases a board of perhaps five men or women, as follows: (1) Judge or lawyer to preside, (2) a representative of the Department of Mental Disease, (3) a physician from Massachusetts Medical, Homeopath, etc., (4) a physician, specialist in nervous diseases, and (5) a layman, preferably a business man or woman. This is only a tentative suggestion and possibly is not workable, but it surely could not be worse than our present chaos of a whirlwind of words from the mental experts. This board could get together and vote on the responsibility for the crime in question, report to the judge a majority and minority report after meeting and discussion, or give just the final report of all the board if all agree. for the consideration and help of both judge and jury in their determination of mental responsibility for capital crimes.

Respectfully yours,

D. J. FENNELLY, M.D.

AN APPEAL FOR HELP

Mr. Editor:

Having a single track mind, about this time of the year my thoughts turn to vaccination, to vaccination of children, to vaccination of *all* children, and I pore over my smallpox scrap book to find arguments for my usual annual appeal to the Great and General Court.

I wonder whether I ought to tell its members about the colored gentleman who was serving a term in prison for some minor offense and who refused to be vaccinated. "No, sah," said he, "I declines dis vaccination. I'll leave dis yer jail first."

Perhaps it would be better to read to them the letter said to have been received by a California health office, which ran as follows:

"M—— of —— Street has so far deviated from the truth that his mind is involved in error, which in your language is smallpox. Please send a physician."

What think you?

Seriously, I once more call upon the medical profession for help, that what went part of the way last year may go the whole way this, that Massachusetts may stand with Rhode Island and the cities of New York, a bulwark against the pressing tide of smallpox, with all its school children vaccinated, those in the private, denominational and parochial schools on the same footing as those in schools supported by the public taxes.

Sincerely,

SAMUEL B. WOODWARD.

CASES REPORTED TO THE MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH FOR THE WEEK ENDING DECEMBER 18, 1926

Anterior poliomyelitis	4	Ophthalmia neonatorum	17
Anthrax	2	Pneumonia, lobar	91
Chickenpox	391	Scarlet fever	327
Diphtheria	108	Septic sore throat	3
Dog-bite requiring anti-rabic treatment	7	Suppurative conjunctivitis	3
Epidemic cerebrospinal meningitis	2	Syphilis	53
German measles	13	Tuberculosis, pulmonary	111
Gonorrhea	129	Tuberculosis, other forms	10
Influenza	8	Tuberculosis, hilum	8
Measles	88	Typhoid fever	35
Mumps	165	Whooping cough	142

WEEK ENDING DECEMBER 25, 1926

Anterior poliomyelitis	1	Ophthalmia neonatorum	25
Chickenpox	265	Pneumonia, lobar	72
Diphtheria	104	Scarlet fever	236
Dog-bite requiring anti-rabic treatment	7	Septic sore throat	2
		Suppurative conjunctivitis	4
Encephalitis lethargica	1	Syphilis	5
Epidemic cerebrospinal meningitis	2	Tetanus	2
		Tuberculosis, pulmonary	72
German measles	7	Tuberculosis, other forms	18
Gonorrhea	20	Tuberculosis, hilum	23
Influenza	14	Typhoid fever	31
Measles	59	Whooping cough	115
Mumps	140		

CONNECTICUT DEPARTMENT OF HEALTH

MORBIDITY REPORT FOR THE WEEK ENDING DECEMBER 24, 1926

Diphtheria	18	Chickenpox	81
Last week	28	German measles	3
Diphtheria bacilli carriers	8	Influenza	2
		Mumps	17
Typhoid fever	2	Pneumonia, lobar	30
Last week	1	Poliomyelitis	1
Scarlet fever	60	Septic sore throat	1
Last week	77	Trachoma	1
Measles	29	Tuberculosis, pulmonary	12
Last week	67		
Whooping cough	28	Tuberculosis, other forms	2
Last week	35		
Bronchopneumonia	25	Gonorrhea	16
Cerebrospinal meningitis	1	Syphilis	3

NOTICES

WINTER TRAINING, MEDICAL DEPARTMENT RESERVE OFFICERS

The next meeting in the Winter Training Schedule for Reserve Medical Department Officers of Boston and vicinity will be held at the Army and Navy Club, Hotel Bellevue, Beacon Street, Boston, Mass., on January 12, 1927, at 8 P. M.

This meeting will have one of the best programs given so far in the course.

Captain Dean continues his talk on essential paper work. Major Greenwall of Fort Banks Hospital will take up Medical Department Administration and Routine Duties of the Medical Officer, Medical Attendance and Sick Call, while Major Henry M. Emmons, Med-Res., will discuss Medical Regiments of Army, Corps, Infantry and Cavalry Divisions.

You are urged to attend and bring another reserve officer or friend with you.

For the Corps Area Surgeon:

HENRY S. BECKFORD, *Major, M.C.*, (*DOL*).

ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION

In addition to the articles enumerated in our letter of November 27, the following have been accepted:

Cutter Laboratory

Diphtheria Toxin-Antitoxin Mixture 0.1 L+.

Eli Lilly & Co.

Cholera Vaccine, Prophylactic.
Plague Vaccine, Prophylactic.
Old Tuberculin Human Strain Concentrated.
Pirquet Test.
Tuberculin Ointment for the Moro Percutaneous Test.
Tuberculin T. R. Concentrated Human Strain.
Tuberculin B. E. Concentrated Human Strain.
Tuberculin B. F. Concentrated Human Strain.
Ampoules Glucose (Dextrose U. S. P.) Lilly 10 gm., 20 cc.
Ampoules Glucose (Dextrose U. S. P.) Lilly 25 gm., 50 cc.

H. A. Metz Laboratories, Inc.

Gynergen
Ampules Gynergen, 1.1 cc.
Tablets Gynergen, 0.001 gm.

Parke, Davis & Co.

Bismuth Salicylate in Oil—P., D. & Co.

Winthrop Chemical Co.

Tutocain
Tablets Tutocain No. 1 (with epinephrin), 0.03 gm.
Tablets Tutocain No. 2 (with epinephrin), 0.03 gm.
Tablets Tutocain No. 3, 0.03 gm.
Tablets Tutocain No. 4 (with epinephrin), 0.05 gm.
Tablets Tutocain No. 5, 0.1 gm.

Yours truly,

W. A. PUCKNER, *Secretary*,
Council on Pharmacy and Chemistry.

NEW AND NONOFFICIAL REMEDIES

The following New and Nonofficial Remedies have been accepted by the Council on Pharmacy:

Ipral — Calcium ethylisopropylbarbiturate — E. R. Squibb & Sons, New York.

Ampules Radium Chloride, 2 cc. — United States

Radium Corporation (radium element, 50 micrograms).

Ampules Radium Chloride, 2 cc.—United States Radium Corporation (radium element, 2 micrograms). For drinking use.

Ovarian Substance Soluble Extract—Parke, Davis & Co., Detroit.

Pertussis Vaccine—Lilly.

Scarlet Fever Streptococcus Antitoxin—Lilly (Refined and Concentrated).

Scarlet Fever Streptococcus Antitoxin Concentrated—Mulford.

Pollen Extracts—Mulford.

Physical Therapy—The Council on Physical Therapy of the American Medical Association publishes a report on the present status of physical therapy. The Council cautions that while there are certain definite indications for the use of some one or a combination of several physical agencies in the treatment of disease, it is harmful practice to depend on these agencies alone, to use them in place of better proved methods, or to employ them without having first thoroughly studied the patient from the standpoint of diagnosis. The Council warns against the indiscriminate use of physical measures and the danger that their use may lead into dishonest practice or quackery. The physical measures that have been found to have certain therapeutic value include: (1) Heat, natural and artificial, (2) hydrotherapy, (3) light, (4) electricity, (5) massage, (6) therapeutic exercises. The Council feels that the following considerations must receive the most careful attention of the medical profession: (1) Physics, physiology and biochemistry must be called on to dispel the empiricism of the past and to prove the value of various physical agencies. (2) Physical therapy must be recognized as a definite part of medicine, practiced and controlled by graduate physicians. (3) Since physical therapy is a definite part of medicine, every medical school should give thorough training in this subject. (4) Persistent, prolonged effort must be made to eradicate the abuses of physical therapy. The Council proposes to point out to the medical profession the advantages and the disadvantages of physical therapy so that its abuses may be reduced to a minimum, and its scientific possibilities may be appreciated. (*Jour. A. M. A.*, October 16, 1926, p. 1302.)

FOUND—SURGICAL INSTRUMENTS

in Back Bay. Owner may have them by giving description. Apply at JOURNAL office.

REPORTS AND NOTICES OF MEETINGS

THE CHRISTMAS SEAL BULLETIN OF THE MASSACHUSETTS TUBERCULOSIS LEAGUE

SEAL SALE BULLETIN NO. 10 (THE LAST FOR THIS SEAL SALE) DECEMBER 27, 1926

INSTITUTE FOR TUBERCULOSIS WORKERS

HEREWITH copies of circular descriptive of the Institute to be held at the Harvard School of Public Health January 31 to February 12, 1927. Please note that the attendance at the Institute will be limited to thirty. Already five have enrolled. If you desire to enroll or know of someone who would be interested in receiving this circular, please advise the League office.

DETAILED PROGRAM OF MONDAY, FEBRUARY 7

At Hotel Copley-Plaza:

10 A. M.—Seal Sale meeting (same room as last year), Frank Kiernan presiding.

12:45 P. M.—Luncheon meeting (same room as last year), Dr. Kendall Emerson, President of the League, presiding. (Speakers to be announced later.)

Following the luncheon there will be a brief meeting of the executive committee of the League in the same room and this will be followed by the semi-annual meeting of the board of directors in the same room.

2:30 P. M.—Health education meeting (same room as last year), Miss Anna W. Johnson presiding.

At Boston Tuberculosis Association new headquarters, 554 Columbus Avenue, Boston:

6 P. M.—Informal supper for secretaries of affiliated organizations, volunteer Seal Sale workers and members of Tuberculosis Institute.

7:30 P. M.—Tuberculosis Institute open session under direction of Dr. Philip P. Jacobs of the National Tuberculosis Association, followed by social hour and dancing.

THE NEXT DAY

Tuesday, February 8, beginning at 10:00 a. m. there will be a meeting of the Secretaries and others interested in Summer Health Camps in the Conference Room of the Little Building (third floor, Room 355).

THE TRUDEAU SOCIETY

THE next meeting of the Trudeau Society of Boston will be held on Tuesday, January 11, 1927, at 8:15 P. M., in Sprague Hall, Boston Medical Library, 8 The Fenway, Boston.

The speaker will be Dr. John B. Hawes, 2nd; subject: "Preventorium Problems;" Dr. Walter A. Griffin, Dr. H. D. Chadwick, and Dr. Olin S. Pettingill have been asked to lead in the discussion.

Physicians, medical students, and nurses are cordially invited to attend this meeting.

RANDALL CLIFFORD, *Secretary.*

ESSEX NORTH DISTRICT MEDICAL SOCIETY

THE 85th Semi-Annual meeting of this society was held in Centre Church vestries, Haverhill, Mass., January 5, 1927.

Following the dinner the business meeting was held, after which these papers were presented:

1. Howard M. Clute, M.D., of Boston, upon "Clinical Differentiation and Treatment of Thyroid Disease." (40 minutes.)

2. Philip Hammond, M.D., of Boston, Instructor in Otology at Harvard University Medi-

cal School, upon "Some Acute Diseases of the Ear, Nose and Throat of Interest to the General Practitioners." (30 minutes.) The discussion of this paper was opened by Wm. H. Merrill, M.D., of Lawrence.

J. FORREST BURNHAM, M.D., *Secretary.*
567 Haverhill St., Lawrence, Mass.

ROY V. BAKETEL, M.D., *President.*
December 28, 1926.

MEETING NOTICE

THE next meeting of the Harvard Medical Society will be held January 11, 1927, at 8:15 p. m., in the amphitheatre of the Peter Bent Brigham Hospital. The speaker of the evening will be Professor Henri Fredericq, head of the Department of Physiology at the University of Liege, Belgium. His subject will be "Humoral Transmission of Nervous Action." Slides will be shown.

All members of the Medical Profession, Medical Students and Nurses are invited.

NEW ENGLAND HEART ASSOCIATION MEETS

THE opening meeting of the New England Heart Association for the academic year was held Thursday evening, Dec. 16, 1926, at the Peter Bent Brigham Hospital.

Dr. William H. Robey, Chairman of the Association, opened the program by a discussion on "The Effect of Tonsillectomy on Acute Rheumatic Fever and Rheumatic Heart Disease." Dr. Robey presented the historical aspect of the subject in his introduction, pointing out the great need of more conclusive research in this field, because of the divergence of beliefs relative to the relationship existing between tonsillectomy and rheumatic fever and heart disease. At this point he was glad to announce that the speaker of the evening was to present data covering a five year period of research done in this field. Dr. Robey stressed the importance of a thorough physical examination of cases suffering from acute rheumatic fever to ascertain the source of the infection, and also the history of the case was stressed. From his experiences he has found that almost invariably the tonsils were involved in the former, and that a history of the case with rheumatic fever usually revealed previous throat or tonsillar trouble. Dr. Robey emphasized the importance of complete removal of the tonsils in cases of acute rheumatic fever, as well as to the time of operation. He presented data covering research work done at the Boston City Hospital on the effect of tonsillectomy in rheumatic fever and heart disease, which are to be published soon.

Following Dr. Robey's discussion, Dr. Place and Dr. Louis M. Freedman of the Boston City Hospital gave short discussions covering their experience in this field, and covering the results presented by Dr. Robey.

The speaker of the evening, Dr. Albert D. Kaiser, Assistant Professor of Children's Diseases at Rochester University, New York, was next introduced by Dr. Robey. Dr. Kaiser's subject was, "The Relationship of Tonsillectomy in Children to Rheumatic Fever and Heart Disease." The following is a summary of Dr. Kaiser's paper:

The frequent occurrence of rheumatic heart disease in children and young adults warrants exhaustive studies as to the etiology of this disease. Assuming that there is some relationship between throat infections and rheumatic fever with its allied manifestations, a study has been undertaken in Rochester of all the school children to determine the incidence of the rheumatic symptoms in tonsillectomized and non-tonsillectomized children. Six years ago, about 10,000 children had tonsillectomy performed in a special tonsil clinic. Anticipating the value of following the effect of the operation on these children they were carefully examined and their preoperative complaints listed. At the same time there were as many children recommended for operation who for various reasons refused to avail themselves of this opportunity. These children were examined and are serving as controls in this follow up study. Several reports have been published on the end results of the operation as compared to the control group based on one and three year examinations after tonsillectomy was performed.

At present a survey is being made of the rheumatic manifestation during the five year period following operation. All school children are listed who have at present or had in the past either chorea, rheumatic fever or heart disease. The occurrence of their symptoms with reference to the enucleation of the tonsils is noted. All unoperated children with these symptoms are also studied. With 70,000 children available for study among whom about 30,000 have had their tonsils removed, some idea of the occurrence of this syndrome in operated and unoperated children may be obtained.

The study is partially completed so that only a preliminary report can be made. Based on a study of less than half of the rheumatic children, it was found that chorea is not greatly influenced by tonsillectomy but endocarditis following chorea seems less likely to occur in the operated child. Rheumatic manifestations are lessened in the operated group after five years, but endocarditis seemed as likely to fol-

low rheumatic symptoms in either operated or unoperated group.

The etiology of valvular heart disease could not always be explained. Especially was that so in the unoperated group. Recurrent attacks were less frequent in the tonsillectomized children. Fewer cases developed in the operated group over the period studied. There seems to be ample justification to advocate the removal of tonsils as an aid to combat the manifestation of the rheumatic syndrome.

SOCIETY MEETINGS

District Medical Societies

Essex North District Medical Society

Wednesday, May 4, 1927—Annual meeting. Russell Hall, Young Men's Christian Association Building, 40 Lawrence Street, Lawrence.

Thursday, May 5, 1927—Censors meet for examination of candidates at Hotel Bartlett, 95 Main Street, Haverhill, at 2 P. M.

Essex South District Medical Society

Wednesday, February 2, 1927—Hawthorne Hotel, Salem. Dr. H. H. Clute of the Lahey Clinic, "Differential Diagnosis and Treatment of Thyroid Disease." Discussion by Drs. Johnson of Beverly and Field of Salem, ten minutes each.

Wednesday, March 2, 1927—Lynn Hospital. Clinic, 5 P. M.; supper, 7 P. M. Dr. George Minot, "Pernicious Anemia, with Special Reference to Liver Diet." Discussion by Drs. Sargent of Salem and Reynolds of Danvers, ten minutes each.

Wednesday, April 6, 1927—Danvers State Hospital. Clinic, 5 P. M. Dr. Allan W. Rowe, Chief of Research Service at Evans Memorial, "The Differential Diagnosis of Endocrine Disorders." Followed by dinner. Discussion by Drs. Wood of Hathorne and Kline of Beverly, ten minutes each.

Thursday, May 5, 1927—Censors meet for examination of candidates at the Salem Hospital, 3:30 P. M.

Wednesday, May 11, 1927—Annual meeting. The Tavern Gloucester. Speaker and subject to be announced later.

Norfolk District Medical Society

Below are the proposed meetings of the Norfolk District for the remainder of the year. Minor changes may be made in case of necessity.

January 25, 1927—Peter Bent Brigham Hospital. Dr. Harvey Cushing. Time of meeting and subject to be announced.

March 1, 1927—Roxbury Masonic Temple, 8:15 P. M. Dr Robert B. Greenough. To be devoted to a talk on cancer, with a résumé of the results of colloidal lead treatment.

March 29, 1927—Roxbury Masonic Temple, 8:15 P. M. Drs F. S. Newell and F. J. Irving, "The Modern Treatment of the Eclampsias and Toxaemias of Pregnancy." If time permits—"The Modern Methods of Handling Prospective Caesarean Cases."

May 10, 1927—Annual meeting. Details of meeting to be announced.

Suffolk District Medical Society

Meetings of the Suffolk District Medical Society and the Boston Medical Library will be held at the Boston Medical Library 8 The Fenway, Boston, at 8:15 P. M., as follows:

January 26, 1927—General meeting in association with the Boston Medical Library. "Medical Work at the Metropolitan Life Insurance Company," Dr. Augustus I. Knight, Medical Director, Metropolitan Life Insurance Company.

February 23, 1927—Surgical Section. "Clinic on Neurological Cases at the Peter Bent Brigham Hospital," Dr. Harvey Cushing

March 30, 1927—Medical Section. Subject and speaker to be announced later.

April 27, 1927—Annual meeting. Election of officers. "Medical Education in the Orient and Occident," Dr. David L. Edsall Dean, Harvard Medical School.

***Notices of meetings* must reach the JOURNAL office on the Friday preceding the date of issue in which they are to appear.**

BOOK REVIEWS

A Textbook of Embryology. By HARVEY ERNEST JORDAN, A.M., Ph.D. and JAMES ERNEST KINDRED, M.A., Ph.D. New York and London: D. Appleton and Company, 1926.

This admirable textbook, dedicated to Dr. David Starr Jordan, represents the authors' teaching in embryology at the University of Virginia. The method of presentation is basically anatomic, with occasional functional interpretations. In connection with the strict morphologic aspects of the subject, there are especially interesting chapters on such ontogenetic data as sex determination, twinning, eugenics, teratology. There is a separate section on laboratory work, with directions for studying sections and representative illustrations of the more important levels of several developmental stages. The book is illustrated with 471 text figures, 33 plates, and one frontispiece showing an early human embryo, with the appropriate Greek line, "Know Thyself."

Imhotep, the Vizier and Physician of King Zoser and Afterwards the Egyptian God of Medicine. By JAMIESON B. HURRY, M.A., M.D. Oxford University Press: Humphrey Milford, 1926. xvi + 118 pages.

Sir William Osler speaks of Imhotep as, "The first Figure of a Physician to stand out clearly from the Mists of Antiquity." Imhotep has long been neglected by medical historians, largely because it is only since Champollion began to decipher the hieroglyphics, about a century ago, that much of the civilization of ancient Egypt has become known to the learned world. Many centuries before Hippocrates, and even long before the Greeks recognized Asklepios as their legendary god of medicine, there lived in Egypt a magician-physician "so famous for his skill in healing disease that he became recognized eventually as the Egyptian god of medicine. To him surely belongs the highest place in our hagiology; to him should physicians all the world over look up as the patron spirit of the *ars medendi*, as the emblematic god of medicine."

Imhotep's career has been conveniently divided by Dr. Hurry into three periods:

I. Imhotep as Contemporary of King Zoser (ca. 2980 B.C.).

II. Imhotep as a Medical Demigod (ca. 2850 B.C.—Reign of Mycerinus).

III. Imhotep as Full Deity of Medicine (ca. 525 B.C.—Persian Period).

In the first period he was vizier to King Zoser, an office combining the departments of the Judiciary, the Treasury, War, the Interior, Agriculture, and the General Executive. As Hurry says, "A prodigy of efficiency must have been required to carry out these multifarious duties." As an architect, he probably designed the Step-Pyramid near Memphis, familiar to every tourist who ascends the Nile. He was also a magician, sage, astrologer, and physician.

As a sage and scribe a number of verses have been ascribed to him, or his influence. The "Song of the Harper," which perhaps does not illustrate Imhotep's whole philosophy, never-

theless points out how ancient is the idea expressed in Corinthians as "Let us eat and drink, for tomorrow we die."

"All hail to the prince, the good man,
Whose body must pass away,
While his children remain for aye.

The gods of old rest in their tombs,
And the mummies of men long dead;
The same for both rich and poor.

The words of Imhotep I hear,
The words of Hordedef, which say:
'What is prosperity? Tell!'

Their fences and walls are destroyed,
Their houses exist no more;
And no man cometh again from the tomb
To tell of what passeth below.

Ye go to the place of the mourners,
To the bourne whence none return;
Strengthen your hearts to forget your joys,
Yet fulfil your desires while ye live.

Anoint yourselves, clothe yourselves well,
Use the gifts which the gods bestow,
Fulfil your desires upon earth.

For the day will come to you all
When ye hear not the voices of friends,
When weeping avails you no more.

So feast in tranquility now,
For none taketh his goods below to the tomb,
And none cometh thence back again."

Another bit, perhaps of a later time, illustrates the Egyptian idea of the virtue of humility:

"If thou be great, after being of none account, and hast gotten riches after squalor, being foremost of these in the city, and hast knowledge concerning useful matters, so that promotion is come to thee; then swathe not thine heart in thine own hoard, for thou art become the steward of the endowments of the god."

Imhotep was not fully apotheosized until about 525 B.C., altho he was worshipped as a demi-god many centuries before. At least three temples are known to have been built in honor of him. One was at Memphis, which became a famous hospital and school of magic and medicine. Another, at Philae, has partly survived and some of the halls which were used for clinical purposes thousands of years ago are extant. Dr. Hurry gives us some excellent diagrams and pictures of the ruins of the Island of Philae. There is another small temple erected in honor of Imhotep at Thebes.

The reviewer feels that this book is one of great importance to medical history. Dr. Hurry has given us a most careful and complete account of the period in which Imhotep lived as well as all the known facts regarding our first physician. References to the literature are abundant, but do not detract from the easy reading of this monograph by the ordinary physician, and a good working bibliography is to be found in the appendix. In addition, there are many notes on the name Imhotep and its variants, the pedigree of Imhotep, and a list of statuettes of the god, many of which are pictured in the text. The book is carefully indexed and the printing and general appearance are up to the standard one expects from the Oxford University Press.

Chemotherapy with Special Reference to Treatment of Syphilis. By J. A. KOLMER, M.D., Dr.P.H., Professor of Pathology and Bacteriology in the Graduate School of Medicine, University of Pennsylvania, and Member of the Research Institute for Cutaneous Medicine. Published by W. B. Saunders Company, Philadelphia and London. Price $12.00.

The author has gathered together in one large volume an enormous amount of valuable data in regard to chemotherapy. The first chapter is devoted to the principles of chemotherapy, the second to methods in detail for determining the toxicity of chemical agents with relation to chemotherapy, then follow six chapters on the chemotherapy of bacterial and mycotic diseases, then twelve chapters on the chemotherapy of trypanosomal diseases, especially various dyes and heavy metals; fourteen chapters are devoted to chemotherapy of spirochaetal and trypanosomal diseases other than syphilis. The last half of the book is devoted to syphilis, taking up the various drugs individually. Detailed directions are given for the various procedures useful in syphilis: intravenous, intramuscular, spinal, cistern, ventricular punctures, et cetera. Finally there is a series of chapters relating to the treatment of syphilis by stages from prophylactic treatment through that of early, late, visceral, central nervous system and congenital syphilis ending with a chapter on criteria of cure and prognosis. The book contains a fund of information painstakingly gathered from the world's best periodicals and from a great deal of original work carried on at the Research Institute of Cutaneous Medicine in Philadelphia. The bibliography is very complete.

Pneumoconiosis. By HENRY K. PANCOAST, M.D., and EUGENE P. PENDERGRASS, M.D. Paul B. Hoeber, Inc., New York. Price $4.00.

This monograph of 160 pages on pneumoconiosis or silicosis is most welcome. The list of references alone makes it of great value while the index of authors and of subjects renders it extremely easy to read. It is well printed on good paper with 23 excellent X-ray plates. The chapters in addition to an introduction include one on dusts, preventive measures, pathology, (telling of unusual complications, racial statis-

tics and pigmentation of lungs), roentgen-ray studies, coincident tuberculosis, an important one on occupations in which they take up pneumoconiosis as it occurs in coal miners, hard rock miners, granite cutters, potters, metal grinders, brick workers, cement and asbestos workers, carborundum and miscellaneous inorganic and organic dusts. The writers divided pneumoconiosis into three stages, according to the X-ray appearances. One must admit that this classification is a somewhat arbitrary one. If one judges from the X-ray plates, however, a classification of some kind is necessary.

The book gives a fair summary of the various conflicting opinions concerning the subject, particularly with reference to the relationship of tuberculosis to pneumoconiosis. Its conciseness and brevity adds to its value. It should be in the hands of industrial physicians and nurses and will prove of value to all those who are interested in tuberculosis and chest work as well as to general practitioners.

Sketch of the History of the Mayo Clinic and the Mayo Foundation. From the Division of Publications, Mayo Clinic. Philadelphia and London: W. B. Saunders Co., 1926. x + 185 pages.

This volume gives a careful history of the development of the Mayo Clinic and details in regard to its various departments and the officers in charge. The astounding growth of this clinic is one of the outstanding features of the development of American medicine. All facts, therefore, in regard to it are of interest to the medical profession. Some idea of the growth can be gained by noting the number of patients registered from 1912-1924. In 1912, slightly over 15,000 patients attended the clinic and there were 9,000 operations. In 1924, the clinic had grown four-fold while the operations were slightly over 23,000. In addition to the surgical development, it is also of interest to note the growth of the medical services, especially in the last ten years.

The latter part of the volume gives the history of the Mayo Foundation for Medical Education and Research. Since 1916 the clinic has contributed to this foundation slightly over $2,000,000.

The book is carefully printed and edited and has a good index.

The X-Ray in Embryology and Obstetrics. By W. A. N. Dorland and M. J. Hubeny. Saint Paul, Minn.: Bruce Publishing Company. 1926. 420 pages.

This volume, written jointly by an obstetrician and a radiologist, presents in a very scientific manner the latest developments in this new field of radiography. The value of radiographs in the study and teaching of embryology and especially in bone development has been emphasized. The value of x-rays in the routine practice of obstetrics would appear to be limited, at least with our present knowledge, by the possibility of injury by the x-rays to the mother or fetus. There is first a brief introduction by George W. Bartelmez, M.D., in which the physics of x-rays and its action on embryonic tissue is reviewed.

He states that "the regions of an embryo which at any given time are developing most rapidly are most susceptible to deleterious influences in the immediate environment. . . . The commonest forms of abnormality we meet with in the human species involve defects in the nervous system." . . . Many of them due primarily to the failure of the neural folds to close and this, when due to the direct action of the environment on the embryo, must act during the fourth week after conception while the neural folds are closing and the nervous system is most rapidly growing. Therefore, as stated later in the book, there is somewhat greater danger in the earlier weeks of pregnancy than in the later. In concluding he states that "with the short exposures now employed in x-ray diagnosis, it is highly improbable that either germ cells or embryos can be affected."

Then follows Chapter I which is devoted to the influence of x-rays and allied substances on living tissue from the protozoa to the human organism. Some of the unfortunate clinical effects of over radiation in obstetric practice are mentioned in the concluding paragraphs.

Chapters II to VI inclusive are devoted to embryonic development as revealed by the x-rays. They are very well written and profusely illustrated, and are a valuable contribution to the literature. The osseous system, gastro-intestinal tract, respiratory tract, vascular and uro-genital systems are separately considered.

Chapter VII describes recent developments in the radiography of the pelvic organs, particularly by the aid of pneumo peritoneum.

Chapters VIII and IX are devoted to skeletal and visceral abnormalities of development as revealed in the radiograph.

Chapter X details the various methods of pelvic radiographic mensuration.

Chapter XI on the radiography of pelvic contraction describes the normal pelvis, the morphology of pelvic deformity, various types of contracted pelvis, the appearance of uterine diseases and bone tumors.

Chapter XII is on the diagnosis of normal intra-uterine pregnancy. Notwithstanding the dangerous possibilities of obstetric radiography, the x-rays are a valuable aid in the diagnosis of pregnancy, particularly in differentiating from certain abdominal tumors, such as fibroids.

Changes in the fetal presentation just prior to, or during the actual progress of labor have thus been demonstrated. The recognition of the fetal outline can usually be demonstrated at from three and one-half to four months, but the x-ray is useless in estimating the age of a premature fetus before birth because of the great irregularity in the tissue of ossification of the various fetal bones. The use of the rays in early and advanced pregnancy is described in some detail and some of the medico-legal aspects of obstetrical radiography are cited.

Chapter XIII is on radiography of abnormal pregnancy. "It is becoming more and more evident that one of the valuable uses of the x-rays in obstetric practice will be to prove the normal or abnormal condition of the fetus and thereby relieve maternal anxiety in cases in which any doubt as to fetal health and normalcy exists." Excessive ossification, ectopic and abdominal pregnancy, lithopedion, obstetrical accidents, abnormal presentations, and multiple pregnancy are among the subjects radiographically considered.

Chapters XIV, XV, XVI which deal with teratology are very complete and profusely illustrated, both with x-ray pictures and photographs of the varied monstrosities.

The entire volume is well written and scientific to the last degree. The reviewer was particularly influenced with the thoroughness with which the literature on the subjects covered has been reviewed and with the very complete bibliography which is appended to each chapter.

From the practical standpoint, it would appear that if radiography is ever to become a routine part of obstetric practice, we must have an accurate knowledge of limits of safety of radiation as regards possible injury to the mother or child, and technical methods which will secure good radiographs with the minimum of exposure.

The Meaning of Disease: An Inquiry in the Field of Medical Philosophy. By WILLIAM A. WHITE, A.M., M.D. Baltimore: The Williams & Wilkins Company, 1926. 220 pages.

The head of the Saint Elizabeth's Hospital for the Insane, in Washington, and a well-known psychiatrist, has attempted in this short essay to examine the principles behind medical philosophy. He takes "disease" as one of the fundamental concepts of medicine and finds great difficulty in even defining the condition. In his analysis he endeavors to illuminate the problem by drawing from among other sciences, using the concept of energy as the common component with which to correlate the findings in medicine and the more exact sciences. He lays special stress on disease as a form of energy in which an attempt is made to establish an equilibrium. In other words, he would view the organism not as a "thing" but as an "event," stressing the dynamic relations rather than the static forces. An example of his argument will be found in the following paragraph:

"Disease, looked at from any angle we will, whether we view it as failure of adaptation or adjustment to the environment, whether as failure to measure up to internal standards of conduct—ego-ideals—whether it represents an inadequate integration of the organism or an inadequate integration of the individual as a social unit, however we view it it presents itself as inadequacy of some sort. This inadequacy may be organ inadequacy, mind inadequacy, social inadequacy but inadequacy it seems always to be and inadequacy expressed in terms of our energy concept must mean that the energy has been stepped down by disease to a lower tension, to a lower level of efficiency, it must mean in the last analysis that disease is coterminous with the degradation of energy."

Little has been written in the field of medical philosophy and any attempt along these lines should be welcomed by the medical profession. Dr. White has done his work well, and although we may not entirely agree with his interpretation of "disease," we would feel that he has done a pioneer piece of work which deserves our closest attention.

Surgical Clinics of North America, 1926. Chicago Number.

Dr. Arthur Bevan goes into considerable detail in describing the technic of a radical excision of a carcinoma of the ascending colon and of resection of the stomach for massive, idurated, pyloric ulcer. Another of his cases bears out Haberer's rule that in penetrating ulcers of the lesser curvature close to the common duct resection should not be made because of the possibility of obstructing the common duct.

Drs. Kanavel and Koch, in a discussion of preoperative and postoperative care of patients, say that the earlier (postoperatively) a patient is given catharties, the more certain is he to suffer from gas pains and abdominal distress. Morphin is to be used to the point of tolerance for seventy-two to ninety-six hours in serious cases, intestinal obstruction with resection, etc. Deep breathing exercises are urged postoperatively after a gall-bladder operation so as to mobilize the diaphragm and ward off pneumonia. Hiccoughs, he treats with a subcutaneous injection of 3 to 4 c.c. of ether and with gastric lavage.

There are many other papers of great clinical value as "Treatment of Gastric and Duodenal Ulcers," "Ovarian Enlargements" and "Biliary Disease from a Surgical Standpoint."